Electricity on the Farm

A Monthly Magazine for the Progressive Rural Family

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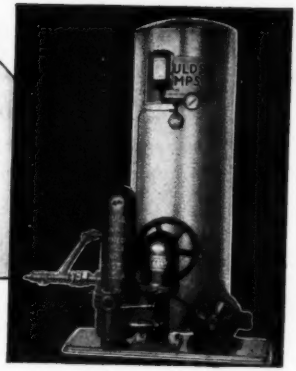

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Electricity on the Farm

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Issued Monthly by
CASE-SHEPPERD-MANN PUBLISHING CORP.
(Successors to Farm Light and Power Pub. Co.)
Editorial-Executive Offices: 24 West 40th Street, New York
Western Office, 30 N. Michigan Ave., Chicago
KARL M. MANN, *President* I. H. CASE, *Vice-Pres. and Gen'l Mgr.*
FRED SHEPPERD, *Editor* K. H. GORHAM, *Advertising Manager*
Subscription price, 75 cents per year; single copies, 10 cents.

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Have *plenty* of
Boiling
HOT WATER
for washing-up
when milking
is done . . . . .

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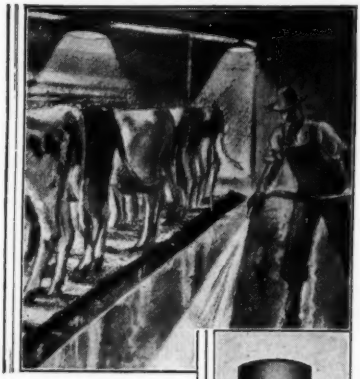

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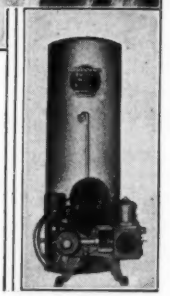

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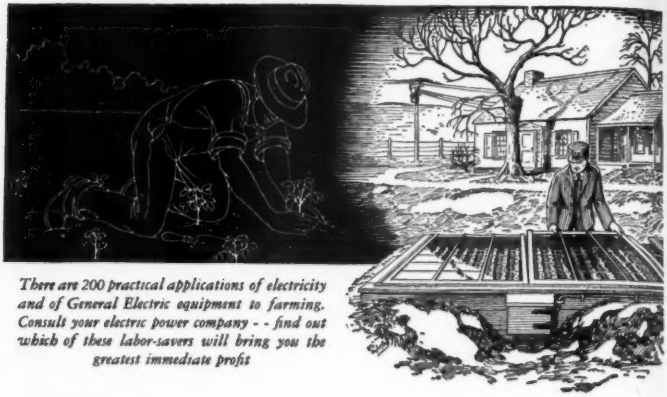

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It's the off-season market that brings the highest prices.

General Electric will help you reach that market by means of controlled electric heat, applied to sprouting benches and hotbeds. It furnishes ideal conditions for rapid, wholesome germination and growth of plants during the early season.

Electric heat employing the G-E system is dependable, uniform, inexpensive, and clean. Its automatic regulation results in carefree operation in the dairy for water heating and sterilizing; in poultry raising, for incubating, brooding, oat sprouting, and water heating; on the diversified farm, for seed germinating, pig brooding, etc.

Send for our new booklet, "Electric Helpers on the Farm." Address Room 317 Building 6, General Electric Company, Schenectady, New York.

Join us in the General Electric Farm Program from WGY, Schenectady, every Monday evening at 8 o'clock (Eastern Standard) and in the General Electric Program every Saturday evening over a nation-wide N.B.C. Network

GENERAL ELECTRIC

ELECTRICITY ON THE FARM

FEBRUARY, 1931

The quality and quantity of work done by a workman is largely dependent upon the tools with which he is equipped. A poorly equipped farmer, who must content himself with obsolete or worn out machinery, labors under an overwhelming handicap.

Better Equipment Makes Better Farmers

Even in the early days of factories it was recognized that better equipment resulted in decreased cost of production, and, if anything, in improved products. At the present time no large manufacturing establishment could long survive if it were content with equipment and methods employed by its predecessors. The successful manufacturer must mark time with progress.

To a great extent, but possibly not on such a wide-spread scale as in the manufacturing industry, the farm field has adopted and put to use new equipment and methods. But many farmers still fail to appreciate not only the value, but also the absolute necessity of modern equipment. Some even fail to recognize this truth until it is too late to stave off disaster.

Extending power lines to farms means little; but the use of current to eliminate tedious labor and produce better products means a great deal. The arrival of electricity makes possible the use of a very large assortment of power driven machines, many of which are suitable both practically and economically on the farm. Among these may be cited feed grinders, silage cutters, pumps, refrigerators, and dairy equipment.

The farm making use of new apparatus as rapidly as it has proven itself is the one which is apt to be among the leaders insofar as profits at the end of the year are concerned. There is much truth in the statement that "better equipment makes better farmers."

An Electrically Equipped Henhouse

Mr. French Armstrong, on whose farm the Cleveland Electric Illuminating Company conducted an electrical farming demonstration, is here shown setting the henhouse lights automatic time switch. This is part of the equipment Mr. Armstrong retained upon completion of the demonstration. In the foreground may be seen an electric water heater inserted in the pail.

Electricity and POULTRY RAISING

By H. J. GALLAGHER

THE advantages of the use of electricity for brooding are the conveniences it affords and the ease with which it is controlled to give uniform heat. The disadvantages are the high cost of operation when electricity is used in brooder houses not insulated to conserve heat and when too few birds are brooded in too large a house.

A Preliminary Survey

To determine the relation of these factors, Mr. O. E. Robey of the Agricultural Engineering Department, Michigan State College, began experimental work in 1928 in adapting electricity to the type of brooder house in general use in Michigan. In making a preliminary study of this experiment before the actual work was begun, the following deductions were made:

First: that better insulation of the brooder house would be required than in other methods of heating.

Second: That the ventilation should be controlled and reduced to a minimum in order to prevent too great a loss of heat.

Third: That the automatic features should be developed as far as possible to reduce labor.

Fourth: That the brooder coop should house the maximum number of chicks to utilize the heat to the best advantage.

The standard Michigan brooder house is 10 ft. by 12 ft., portable, shed type, having windows on the south side. The common method of construction is to build with a minimum amount of framing covered with one thickness of matched lumber, the roof one thickness of shiplap and a layer of felt roofing. The cost of this type of building is between $80 and $100. To install an electric brooder in this house meant an excessive loss of heat as the rated B. T. U. loss per square foot per hour per degree of difference in temperature for one layer of matched boards is .55. Would insulation conserve enough heat to pay for the additional cost of construction?

To insulate with one layer of standard insulation 500 square feet of material was required costing $25. Interest, depreciation and repairs on this additional investment were computed at $4 per year. Based on a sixty days' use of the building each year this would amount to 6.6 cents a day. Accepting the rated B. T. U. loss for one thickness matched boards plus one layer of the insulation used as .26, the insulation reduces the heat loss .29 B. T. U. per square foot per hour per degree of difference in temperature. To maintain a temperature of 80° F. inside the brooder house when the outside temperature is 32° the insulation saves 2.03 K.W.H. per hour.

Saving Varies

The resultant saving would amount to 48 K.W.H. per 24-hour day, this saving would vary as to the temperature outside the brooder house, the ventilating system used, the number of times the door was opened, etc.

Using the same method of calculation, two layers of insulation will effect a saving of .35 B.T.U. per square foot per hour per degree of difference in temperature or the rated value of the second layer of insulation is only .06 as compared with .29 for the first layer or about one-fourth as effective, yet it results in the saving of .5 K.W.H. per hour. The total saving by insulation is then 2.5 K.W.H. per hour.

In other words, the expenditure of 13.2 cents per day for two

The old henhouse which was large enough to accommodate but 100 chickens, has been replaced by this modern structure which houses 1200 birds.

layers of insulation would save 60 K.W.H. per day.

It was estimated that there would be a loss of 3,610 B.T.U. per hour from this building on a day when the outside temperature was at freezing.

The double layer of insulation was added to the house by putting one layer on either side of the studs and rafters before siding and roofing. One layer only covered the floor boards and it in turn was covered with galvanized iron. This protected the insulation and aided in keeping the floor sanitary.

Windows are a real problem in insulated brooder houses, as glass is a great conductor of heat. In 1928 the windows were sealed with insulation in frames during the night and on days when the sun did not shine. During 1929 the window openings were sealed to conform with the rest of the construction and artificial light was used entirely. This made it possible to maintain much better heat regulation and apparently the chicks did not suffer from lack of sunlight. In this experiment the ultra violet lamps were not used, but we feel that artificial sunlight could be more economically used than windows.

Ventilation

It was realized that if too much cold air was allowed to pass through the coop it would require a great deal of heat. We have come to believe as a result of our calculations and experiments that, if the air used in ventilation is kept down to a minimum, the heat losses as a result of ventilation will be nearly offset by the heat generated by the bird.

Arrangement

From our studies of brooder house heating by electricity in the winter of 1928 we found that there was considerable difference in temperature between the floor and the ceiling, that the upper part of the brooder house was usually from 5 to 10 degrees warmer than at the floor. This resulted in cold corners and draughty spots at various places in the brooder house outside of the hover. In 1929 we decided to take advantage of this condition by constructing a brooder on the storage type in which there were several tiers of hovers, one above the other. The upper hover being used for the smaller chicks, while as they developed they could be placed in the lower hovers where the temperature would be slightly colder and finally could be put on the floor of the brooder house. By this arrangement it was found easily possible to maintain a difference of temperature of 10 degrees between the upper hover and the lower tiers. In fact, if the upper hover was properly regulated for a given temper-

ature the lower hover would automatically assume the proper temperature for chicks which were four or five weeks older than the ones above. Trays or draws were used to hold the chicks. They were made of galvanized iron with holes punched in for the chickens to feed through, the troughs for the feed were made a part of the draw by simply folding the edge up at the sides. The water was provided by troughs which were attached at the front. The bottom of the tray was made of hardware cloth with a galvanized slide underneath for catching the droppings.

Heating

A forced air system of heating was used. A small electric fan was placed in a box or drawer containing the heating elements. This fan forced the cold air across the heating coils. These heaters were ordinary "plug-in" heating elements such as are used in radiant heaters, except that two elements were used in series so that coils were kept at a black heat. This cut down the fire hazard from dust which would come in contact with the heating elements. The heated air was driven through pipes to the upper tier of hovers and delivered at approximately 90 degrees. A small portion of this air was drawn from the outside; this could be regulated by a damper, while the larger part of it was re-circulated from air taken near the floor. It was found that lower floor temperatures could be obtained by taking the re-circulated air from a little higher point. The heating elements were arranged in banks, each controlled by a separate relay and thermostat. When the temperature on the outside required only a few elements to operate, only one relay "cut in." When it was colder, then the rest of the elements would automatically come on to maintain the proper temperature. One of the difficulties experienced with a coop of this type due to the extra insulation used was that in the spring when the temperatures outside were up around 70° and 80° and the sun shining on the coop that practically no heat was required from the electric heating elements and very often the temperatures would run up higher than the required amount and it was necessary to provide some means of taking out the excess heat. The master thermostat which controlled the heating elements was provided with a double contact so that when the temperature reached a certain point higher than required it would automatically turn on an electric fan which would blow the excess heated air out of the coop. Of course, when the temperature outside was nearly to the same point as the required temperature

The galvanized iron trays on the shelf in the background have become the home of chicks up to three weeks of age when they are put under a standard electric hover as shown in the foreground. This arrangement is intended to increase the capacity of the average brooder coop.

on the inside, or even above this point, it was rather hard to maintain a uniform temperature, but regulation was much better than when the ordinary coal stove was used. Because the control was automatic the coop did not become cold due to the fires being let out, but would very quickly respond to any sudden changes in temperature on the outside.

Moisture

There was no trouble from the condensation of moisture with the forced air circulation. In fact, there seemed to be a lack of the proper amount of moisture. Therefore, during the second brooding period in the spring of 1929, a humidifier was installed to control the moisture in the brooder coop. This consisted of a tank of water with a small immersion heater in the bottom. At first it was decided to place an automatic control upon this heater, but after running it for a while it was found that this was not necessary. It seemed to maintain about the proper moisture condition when regulated by the attendant once or twice a day. An indicating hygrometer was hung in the coop, so that the attendant could tell when the proper amount of moisture was present. On rainy days it was not necessary, of course, to have any more moisture injected in the coop. On other days, when the air was dry, it was necessary to turn on the humidifier for a part of, or all, the day. However, there could be made very easily an automatic device for controlling the moisture.

Capacity

As previously stated, one of the objects of the experiments was to increase the capacity of the average brooder coop, so as to utilize more efficiently the heat produced by the electrical heating element. On the low side of the coop there was room for a battery of twenty trays or draws. Although in this experimental coop only 12 were used. Each tray would hold an average of about 50 chicks. By building the coop with a gable roof, it would be possible to put the same sized battery on the opposite side, leaving an alleyway in the center. This would make it possible to handle about 1,600 chicks in the one coop and undoubtedly this increased number of chicks would not require any more heat than the one with the small number which was experimented with. With the fan equipment it would be possible to maintain the proper ventilation with a larger number of chicks. It was thought that the close confinement of the chicks in the trays might possibly cause cannibalism. There were a few cases of this present, but by the use of blue lights this was held in check probably as well as if the chicks were running loose on the floor.

New Brooder Coop

At the present time Mr. Robey is working on a modification of this coop to meet the needs of the small poultryman. Instead of using the battery brooder a shelf two feet from the floor extends lengthwise along the back of the coop. Upon the shelf are two galvanized iron boxes 4 x 5 feet square and 12 inches deep. The top and sides are insulated, the bottom is covered with hardware cloth to permit the droppings to pass to a galvanized iron tray beneath. The three sides are punched with holes, through which the chicks feed and drink. The top is hinged to swing upward. Each brooder is heated by two radiant screw base heating elements inclosed in a metal jacket 8 inches in diameter, and another metal jacket 10 inches in diameter incloses the first so that the air is heated on the same principle as in hot-air furnaces. The heating elements are connected in series and thermostatically controlled. Each box will accommodate 150 chicks. At the age of three weeks the chicks are put on the floor and brooded under an ordinary standard electric hover. A brooder house of this type accommodates 500 to 600 chicks and permits the maintaining of proper temperatures for both young chicks and chicks over three weeks of age.

Keeping Truck Crops Fresh

FOR EARLY MARKET

By L. W. GRAY

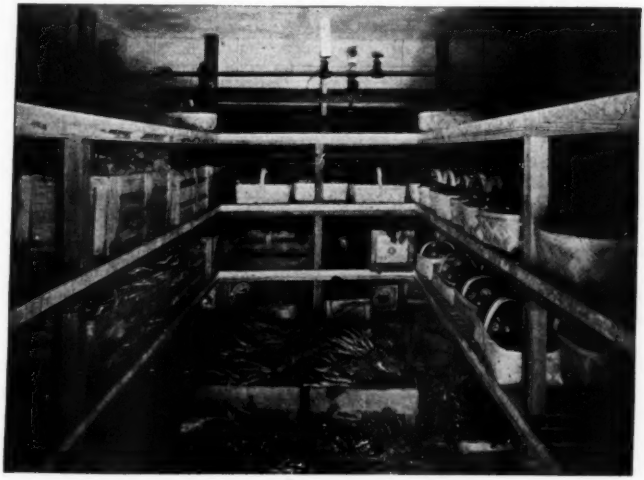
MR. R. F. SAMS, Jr., a progressive truck farmer near Clarkston, Georgia, has installed a refrigeration plant on his truck farm for the protection of his product after it has been harvested. This plant is proving a source of satisfaction as well as a profit maker to him.

Harvesting such truck crops as spinach, turnip salad, beets, beans, tomatoes, okra, onions, squash, raspberries, blackberries, etc., presents varying problems and particularly as to the most efficient manner of marketing. The early Monday market for spinach and turnip salad is good and there is often a rush to gather the crop at this time. Sometimes labor is plentiful, but a shortage of labor means a late market and low price.

Fresh and Crisp

Spinach and salad gathered on Saturday (practically no Sunday work is done on the farms in Georgia) and placed on cold storage is ready to be moved to the early Monday morning market fresh and crisp and brings the top price. As the market becomes overstocked and prices get lower, back to the storage it goes for the market the next day.

Tomatoes undergo a similar cycle, periods of scarcity and lower stocked markets occur but with



Interior view of one of the refrigerated compartments of Mr. Sams' cold storage plant in which vegetables are kept fresh for market delivery.

proper temperature regulation tomatoes can be held over rather lengthy periods.

Raspberries are particularly adapted to electrical refrigeration and undergo a dehydration that improves the texture and makes it possible to carry them over several days with no ill effect of breaking down after removed from storage. Raspberries are placed on the market as gathered and after the middle of the week find the prices low. By Saturday the demand is good with a scarcity and prices again high which offers the opportunity to unload the storage for good profits.

Increased Profits

And so on the cycle may be repeated over and over with many of the choicest vegetables offering more opportunity for increased profits through the control of the marketing period by means of cold storage.

Mr. Sams' plant as shown in the picture consists of two cork insulated chambers one 12 x 12 x 8.5 and one 7.5 x 7.5 x 7. The two chambers are used for different temperatures. This plant cost around $2,500 and requires approximately 750 KW Hours of electricity per month to operate it during the summer months. He contemplates increasing the capacity by the next season as it pays him handsome dividends in the way of increased profits through higher prices obtained for his products.

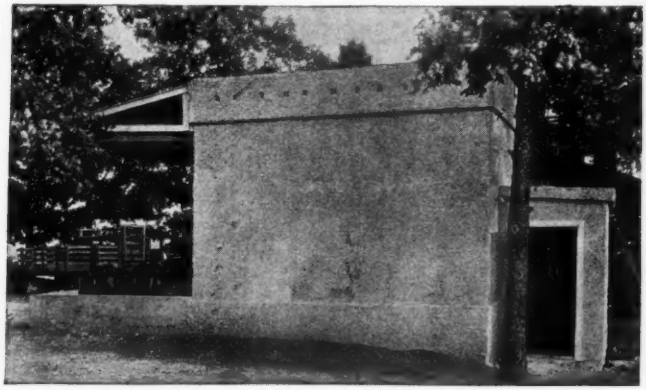
Tank Heater Paid a Profit

Value of Warm Water for Dairy Cows Proved by Iowa Farmer.

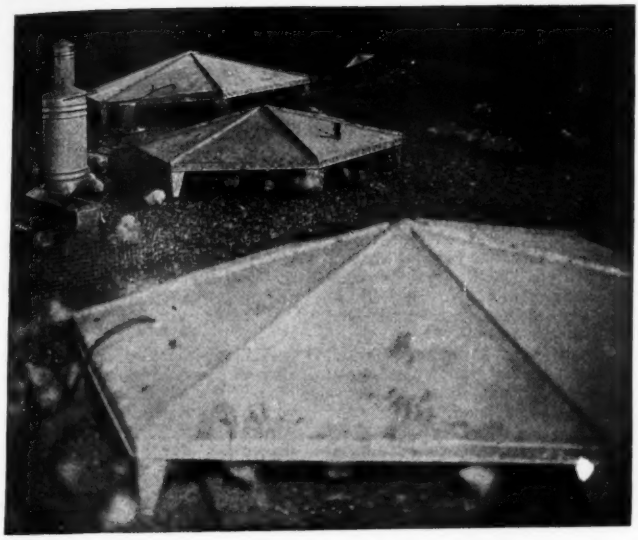
Icy water is an impediment to profitable growth of any meat-producing live stock and to production of dairy cows and poultry flocks. In winter time, investment in a tank heater will likely pay for its cost, provided the live stock would otherwise be forced to drink ice cold water.

Will Klatz, a member of the Chickasaw, Iowa, Cow Testing Association, proved the value of warm water. He paid $25 for a heater and the following month his cows made an average gain of 5.6 pounds of butterfat each. Value of increased production was $28.34. The equipment paid for itself in one month and had sufficient margin of profit to pay for a winter's supply of coal.

However, it is both more convenient and more effective to pipe the water to the cows so that they can drink in comfort whenever they wish.



Exterior view of Mr. Sams' refrigeration plant which he had erected on his truck farm near Clarkston, Georgia.



Electric brooders are convenient in any building

Those New Brooders

By E. R. MEACHAM

EARLY in January we met at the County Agent's office to lay plans for Farmers' Institutes. There were six or seven men and two or three women from various parts of the county. We first discussed the number of Institutes we should have and how to distribute them about the county to draw the biggest crowds and do the most good. Then we tried to select dates that would conflict as little as possible with other events. We knew that the dates agreed upon would largely govern our choice of speakers from the State Agricultural College, for their schedules are made up a long time in advance, and only certain ones might be available at the times we selected. But all was harmonious until the question of topics for the program came up. Then the argument began.

"I'm gettin' pretty dang tired of bein' preached to about outlooks, trends, and cycles," grumbled Uncle Jake Jones. "I'm still able to read my farm papers, and if my hindsight wasn't any better than my foresight, I can always jog my memory by the published curves and statistics on everything from oats to onions. In the last twenty years I've seen the price of beef bob up and down from 4 to 11 cents, and hogs sell at anywhere from 6 to 19 cents. I decided long ago that my big problem was to cut the cost of producin' the stuff below the price I had to take for it. Some of these institute fellers have given me mighty good ideas about that, and

I ain't too old to learn a few new tricks, yet."

"I agree with you, Uncle Jake," chimed in Bill Durner. "I ain't had the years of experience that you have, but I learned all about pure bred sires way back when I went to school, and it seems as though I've heard about 'em at every farm meeting I've attended since. I don't notice that any new advantages have been discovered. In fact, I don't believe that a pedigree just by itself is as valuable as it used to be, for with so many breeders selling pure bred sires there's bound to be a lot of pedigreed scrubs on the market. Besides all that we've used good sires so long that our grades are a whole lot better than they used to be. Why can't we hear about the new things that we don't know anything about, yet, so's to keep up with the times?"

"Well," suggested the County Agent, "electricity is a new thing in farming. What would you like to know about that?"

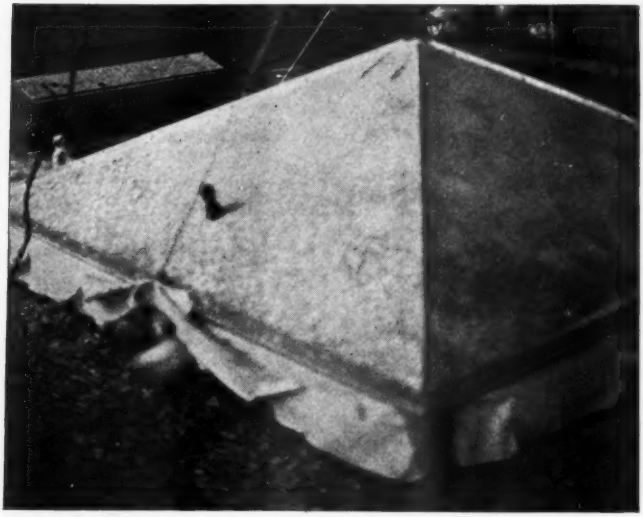
"I'd like to know how it will help me raise chickens," said a bright-eyed little woman from over in Exeter. "There's a flock of chickens on pretty nearly every farm in this county, and if electricity will make those flocks more profitable or easier to raise and take care of the way I've heard it will, those Institute workers ought to tell us how to do it. Whatever else they talk about I want to learn all about these electric brooders I've seen advertised. I just don't see how they can possibly work the way they say they do without any fire or anything."

Reduces Labor

A loose-jointed chap over in the corner tilted his chair up on its hind legs and leaned against the wall. "You never saw anything work so nice in your life," he drawled. "I've had one for three years, and I hardly have to work with it at all."

"Well, for goodness sake what keeps it warm?" she asked.

"The electric current flowing through the wires in it," said Walter TenEyck, "just the same as in an electric lamp. You've



The sloping roof prevents chicks from roosting on the brooder

got electric lights, haven't you? Well, in the lamp bulb the little wire gets white hot and that's what gives you light, and in a toaster they get red hot, that's what browns the toast, but in a brooder you want a nice, even, gentle heat, so the brooder wires are big enough to get warm, but they shouldn't get hot enough to change color."

"Now isn't that simple when it is explained," beamed the woman. "But my toaster burns the bread if I leave it in too long, and you surely can't be putting those chicks in and out of the brooder all the time. How do you keep it from getting too hot?"

Thermostat Control

"With a little thermostat, same as any other brooder," he explained. "Only in this case the thermostat operates a switch to cut off the current if the temperature rises too high and then to turn it on again before it gets cooler than it ought to be. Oh, I tell you it's a slick rig," continued Walter, warming up to his subject now that he had an interested audience. "If I were to tell you all of its advantages you would think I was an agent tryin' to make a sale."

But he went over them just the same. In the first place, he pointed out that an electric brooder is all in one piece, light, easy to handle, and with nothing to put together. When it is not in use, he stores it in the attic or hangs it on the wall. It is ready for instant use by plugging it in to any outlet, the same as a vacuum cleaner or flat iron, and turning the thermostat screw so that it will keep the temperature he thinks the chicks ought to have. That makes it handy to use anywhere—in the barn, or even in the house. It needs no chimney or pipe to carry away the smoke, because there is no smoke. And there are no fumes or gases in the room where the chicks are, either.

He reminded them that any kind of fire, or even a lamp, that may not give off any noticeable smoke has to use up the oxygen in the air in order to burn at all. He claimed that little chicks under a brooder need as much oxygen as they would get if they were outdoors, and that his way of brooding gives them first chance at it.

"If you have decent wiring, and you're foolish to hook onto a power line till you know your wiring's all right, you practically overcome all danger of fire, and that's another mighty big advantage," he went on. "The freedom from worry it gives me is worth a lot more than the brooder cost.

"I get more sleep, too. When it was real warm and I used to have a very low fire in my coal brooder I never could be sure it wouldn't go out entirely during the night. On the other hand, if it was mighty cold and I had a good fire I used to be afraid it would run out of coal, or if it suddenly turned cold in the night I was always worried about whether the stove was responding to the change or not. So I had to get up and dress and go out there pretty near every night. Most of the time it wasn't necessary, I'll admit, but just the same I saved some mighty bad losses by being on the job. Of course, when the electric brooder was new and I didn't know what it would do I watched it pretty close, too, but I soon discovered that in a good, tight, insulated brooder house it would take care of about any situation that came up."

"Now, Walt, you're takin' in too much territory," objected one of his neighbors. "It can't do a darn thing when the current is off, and you know it."

Nothing to Fear

"You said a mouthful, Herb," grinned Walter, "and I'm glad you put it in just those words. When the current goes off and I know it, I have nothing to fear, for I can throw an old canvas or some gunny sacks over the brooder to hold the heat in and the chicks penned up underneath it will keep warm for a good long time. The fact is, that when the current goes off I do know it for I bought a little attachment and a couple of dry cells that ring a bell in the

house whenever the power goes off the line for any reason."

"I don't think that's a thing to worry about," put in the County Agent. "I notice that electric service is a good deal more reliable than it used to be. If it wasn't, electric clocks wouldn't be so popular. But you know, people are buying them all over the country, and they certainly don't stop very often, and usually for only a few minutes when they do. I think Mr. TenEyck is right in saying that chicks are not likely to suffer under a brooder during one of those short interruptions."

"Well, it sounds all right, if one could afford it," sighed the woman from Exeter, "but those electric machines must be pretty high priced, and I'll bet it costs an awful lot to heat a whole brooder house just with electric current."

A Warm Shelter

"I don't pretend to heat my whole brooder house," TenEyck remonstrated. "An old cluck with a brood of chicks certainly doesn't try to heat all outdoors. All she does is provide a warm shelter for the chicks when they're cold, and that's all I do with my brooder. To begin with I built my brooder house tight so the wind couldn't blow through it and cause drafts, lining it with a good insulating wallboard and putting down a double floor, but the only place that's really warm in there is right under the brooder itself. It doesn't do the chicks any harm to scamper around in the cold if they have a good place where they can run in and get warm again."

"It seems as though they're makin' and sellin' enough brooders now so that the price is coming down. The circulars I get have 'em priced for less than I paid for mine three years ago."

"Well, how much do they cost?"

"That's rather a broad question," interrupted the County Agent. "You get about what you pay for, you know, and the cheapest one is not always the best bargain in the long run. In my files over there I have the catalogs from two or three reliable concerns who list brooders for from 200 to 350 chicks at from $20.00 to $30.00. I will be glad to give you their addresses."

"How much do they cost to run?" insisted the woman from Exeter.

Worth the Cost

"I'd have to guess at that," admitted TenEyck ruefully. "I never had a separate meter on mine, but just judging from the difference it seems to make in my electric bill, I figured that the time and the worry and the monkey work it saves are well worth all it costs. It seems to me I've raised bigger, stronger chicks, had 'em feathered out better and looking more like real broilers in shorter time since I had this brooder than ever before, and I know I manage to save a higher per cent of my chicks than I used to, either because of the brooder or because I have learned more about taking care of them. But I don't know just what the current cost is."

"Maybe I can settle that point," said a man who hadn't spoken before. "From all I hear and read it is a good deal like the cost of running a car. It depends a whole lot on the road, and the car, and where you buy your gasoline, and maybe even more on you, yourself. I've been planning on a brooder as soon as we get a power line along our road, so I've been writing to different experiment stations for that very information. From Purdue I learned that Indiana farmers use from ⅛ of a kilowatt hour to pretty near 4 kilowatt hours for every chick raised under an electric brooder. It seems that one reason that last fellow's cost was so high was because he lost more than half of the chicks he started with, and his brooder was about three times too big for his chicks, even at the beginning. Maybe he kept 'em too hot, too, for he used twice as much current on a hundred and fifty chicks as other folks with 500 chicks used during the same time of year. On the average, the Indiana figures show that half a kilowatt hour should be enough to raise a chick under their conditions. What that means in dol-

lars and cents depends on what you are paying for current."

"And just now, I got this Oregon Agricultural Experiment station Bulletin No. 262 on Electric Brooders at the postoffice. It shows one test of brooding 400 chicks for six weeks using electric current and coal for fuel. With electricity at 3 cents per kilowatt hour and briquets at $17.00 per ton, the six weeks brooding with the best electric cost 8 mills per chick and with the coal stove 13 mills per chick. That's mighty cheap in either case, but quite an advantage for the electric."

"The following year the Oregon people brooded 350 chicks for 8 weeks and added an oil burning brooder to the group, figuring kerosene at 18 cents a gallon. Because of the smaller number of chicks and the longer brooding period the costs are somewhat higher. The same electric brooder mentioned before cost 18 mills per chick brooded, while another electric dropped down to 16 mills, and the oil brooder showed a cost of 31 mills, or almost twice as much as the most economical electric.

"Now that's the kind of stuff I was talkin' about in the first place," declared Uncle Jake Jones. "We ought to get the lowdown on things like that so as to change our methods to meet new conditions as they come and not ten years afterwards. I never cared much for chickens, myself, but the

(*Continued on page 36*)

RECORDS OF ELECTRIC BROODERS OPERATED ON INDIANA FARMS, 1930

Chicks Brooded	Mort. Per Cent	Brooding Dates	Brooding Days	Fuel Used Kw.-Hr. Total	Fuel Used Kw.-Hr. Per Chick Raised	Breed Chicks	Brooder
234	29.5	April 29 June 2	34	52	0.315		48" Hex.
450	8.80	May 3 June 7	35	57	0.139	W. Leg.	52" sq. 660 W.
400	1.25	May 2 June 6	35	62	0.125	W. Leg.	52" sq. 660 W.
500	2.00	May 2 June 6	35	80	0.163	W. Leg.	72" rd. 610 W.
342	3.80	April 25 May 31	36	103	0.313	W. P. Rocks	52" sq. 660 W.
312	14.7	April 16 May 25	39	100	0.376	R. I. Reds, W. Leg.	52" sq. 660 W.
240	41.2	May 13 June 22	40	91	0.695	W. Leg., W. Wy., B. P. Rocks	56" rd. 440 W.
313	4.79	April 10 May 20	40	121.5	0.408	W. Leg.	56" rd. 440 W.
343	33.2	April 19 May 30	41	102	0.436	W. P. Rocks	52" sq. 660 W.
260	25.7	April 22 June 2	41	138	0.715	B. P. Rocks	52" sq. 660 W.
445	17.5	April 8 May 20	42	153	0.417	W. Rocks	52" sq. 660 W.
150	54.6	May 5 June 16	42	192	3.82	R. I. Reds	52" sq. 660 W.
386	12.7	April 16 May 28	42	180	.0524	B. P. Rocks	52" sq. 660 W.
520	4.23	April 7 May 19	42	75.5	0.152	W. Leg.	56" rd. 440 W.
265	15.5	May 6 June 17	42	81	0.361	B. P. Rocks R. I. Reds	42" sq. 500 W.
410	3.66	April 23 June 4	42	126	0.319	W. Leg.	56" rd. 440 W.
360	8.88	April 4 May 20	42	85	0.259		52" sq. 660 W.
308	15.2	March 18 April 29	42	179	0.686	B. P. Rocks	52" sq. 660 W.
325	24.6	May 6 June 19	44	124	0.506		52" sq. 660 W.
300	1.33	May 2 June 17	46	77	0.260		52" sq. 660 W.
312	55.4	April 10 June 5	56	167	1.20	Buff Orp.	42" sq. 500 W.

New Equipment for 1931 Shows Many Changes

Farm Equipment Improved; Designed to give maximum of Efficiency.

By E. T. Leavitt

CO-INCIDENT with the increase in rural electrification has come the development of equipment for the use of farmers making use of this source of power. Along with the newer models of tractors and power tillage tools displayed by dealers during Farm Equipment Week, February 16-21, will be seen ensilage cutters, feed grinders and mixers practicable for the farm utilizing smaller electric motors as their source of power. These have been improved in design to operate more economically and efficiently on the loads made possible by the average farm transformer. A new and useful device to supplement the present motor driven clippers is a clipper which operates off the vacuum pipe of any standard milking machine, making it easy to keep the cows' udders and flanks clean.

An electric motor with this set-up makes grinding of grain a semi-automatic job.

Fully of equal importance will be the display of automatic water systems which not only bring comfort to the home but are of economic importance in fire protection and in connection with the production of poultry and dairy products. It should not be necessary to tell any man on the farm the economic value of his wife, yet frequently her work is not sufficiently appreciated until an actual breakdown in the home occurs. This too often comes as a result of exhaustion brought about by lack of proper equipment.

Contribute to Income

Of a group of 179 Nebraska farm women, 70 per cent reported substantial contributions to the family income. Eighty-two per cent took all or a major care of the poultry; 64 per cent did most of the work and 16 per cent all of the work in the farm garden; 44 per cent helped with the milking; 38 per cent did all and 58 per cent part of the family sewing; and the group as a whole prepared on the average from 11 to 60 extra meals each month. Among these farm women only one-fifth had electric lights and 41 per cent had running water in their homes. If the farm housewife shows a considerable interest in a new water system or in getting electricity, the conclusion should not be drawn that she is lazy or wants to devote her afternoons to bridge.

When it costs but 10 cents, or even less, to furnish the power necessary to pipe the daily water supply just where it is wanted in the house, in the dairy barn, to the poultry house and other outbuildings it seems impossible to believe that on nine out of ten farms in this country water is still hand pumped and carried into the house.

A Correction

In reporting the title winners on the contest page of our January issue, the address of Mr. E. J. Boddy was erroneously given as Vancouver, Michigan, instead of Vancouver, Washington.

ELECTRICAL HOUSEKEEPING

Conducted by
GAIL MEREDITH

The Cost of Clean Clothes

WASH days vary, but washings pile up in every home. Keeping a family clean is a fairly big job in itself. It has always made large demands on the time and strength of the home maker. That is why substituting electricity in a machine for woman power on a washboard seems such an important and economical change.

Machines are bound to be cheaper than women.

Only last month I heard that vivid young home service specialist from Michigan, Miss Evelyn Turner, give an interesting talk on the effect the use of electric equipment is having on the home.

"By cutting down a lot of the physical labor of washing and cleaning, electricity is giving folks time for some of the requirements in home making," she said. "Mothers today have time to take an intelligent interest in nutrition and temper tantrums. They no longer shake their heads mournfully when Johnny throws himself on the floor screaming with temper, and say, 'He takes after his father.'"

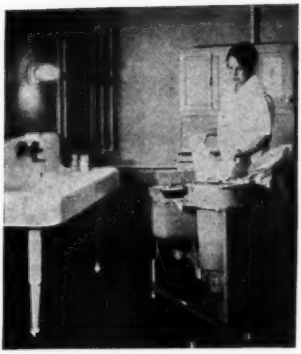
Reduces Working Hours

They have more time to read and think and study, she points out, because they do not have to be on top of the job all of the time.

Then she told us what a washing machine meant to a woman she knew upon the northern peninsula.

At one of her farm meetings she was standing beside an electric washing machine watching the crowds come in, when a friend, a Finnish woman who has not been in this country very long, came up to speak to her.

"I'm glad I'm alive," she began.



The electric washer has brightened many a blue Monday.

Miss Turner looked at her in startled surprise.

"That's nice," she replied.

The woman reached out and put her hand on the washer.

"You couldn't have made me believe five years ago that I'd ever have one of these things. In the old country we had it different. We only washed twice a year, and it took a week each time."

"How did you do your washing? Did you use washboards?" asked Miss Turner.

"No."

"Did you have soap?"

"No."

"How did you ever get the clothes clean?"

"We got down on our hands and knees on the stones at the edge of the stream and washed the clothes on the rocks."

Clean clothes cost a lot that way.

Several of the State Experiment Stations have recently studied the various jobs that go into home making.

Their reports show just how

Laundry List of Typical Farm Family

	Farm Number 3	Farm Number 4
Children's Clothes	**No. of Pieces**	
Stockings	4-5	
Blouses	1-3	
Dresses	1-3	
Undershirts	1-2	
Drawers	2-3	
Union suits	2	
Slips	1	
Playsuits	2-5	
Pajamas	4-6	
Handkerchiefs	4-7	
Suit or Pants	1	
Linens		
Sheets	5-7	2-4
Pillowslips	5-8	6-8
Table Cloths		1-3
Napkins	5-7	9-17
Small Table Linen	5-6	1
Runners or Scarfs	1	1
Dishwipers	3-4	3-8
Towels, hand	3-5	7-14
Towels, bath	7-13	8-15
Crib Blankest	1-2	
Wash Cloths	5-10	
Crib Blankets	1-3	
Crib Sheets	2-3	
Odd Clothes		16-30
Nightgowns	1-3	1-3
Pajamas		1
Dresses	1-2	2-7
Brassiers	1	4-5

	Farm Number 3	Farm Number 4
Men's Clothes	**No. of Pieces**	
Shirts, plain or work	3-4	3-6
Shirts, collar and cuff	1-2	1
Shirts, dress	1-2	2
Soft collars	1-3	1
Night shirts	1	1
Pajamas, pair	1	1
Undershirts		1
Union suits	2-4	3-4
Socks, pair	3-4	3-5
Handkerchiefs	3-4	10-20
Overalls		2-6
Trousers	1-2	
Union-alls		1-2
Jumpers		1-5
Women's Clothes		
Skirts		1-2
Handkerchiefs	5-6	12-32
Slips	1-2	2-4
House dresses	1-2	1
Aprons	4-5	4-10
Chemise	1-3	
Bloomers	1	2-6
Combinations	2	1
Undervests	1-2	3-4
Stockings.....	3-4	4-10

much of the home maker's time clean clothes cost.

In South Dakota a hundred women used on the average three hours and fifty-two minutes every week to do their washings. Out in Washington, they spent four hours a week at the job.

Nobody knows just what it costs to rub clothes clean on a pile of stones. Nor have women been in the habit of casting up accounts with a scrubbing board to measure the value of the time they spent over it. But since electricity has been put to work rubbing the clothes, hundreds of little meters have been given the job of measuring just the amount of current it takes. We can put our finger on that.

In South Dakota they found that eight different families were using just over half a kilowatt hour of current for each washing. These tests ran over a period of twenty weeks and covered 160 washings. The average family had six folks to wash for.

In New Hampshire six different washing machines were metered on six different farms. The average use of current on these farms was 2.45 kilowatt hours a month.

A housewife curious about comparing the cost of current and the strength of her own arms and back, asks at once,

"But what was the washing that current did?"

A Checkup Made

Foreseeing this, Mr. W. T. Ackerman who was in charge of the tests up there set out to find what was in a typical laundry basket. They checked the items on two farms for six consecutive washings.

Farm No. 3 had three grown ups and a boy and a girl under ten. The woman used to fill the machine five to six times at each washing, taking from two and a half to three hours for the job.

The family on Farm No. 4 was all grown up. There were six of them. The woman here found it necessary to fill the machine seven times at each washing.

Above is given their laundry list.

RELIABILITY
Marks ALL
MYERS
Self-Oiling
Water Systems

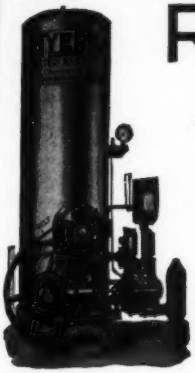


Fig. 2510
Shallow Well System

Fig. 2621
Deep Well System

YOU turn the faucet and the water flows—any time, day or night! Yet the vital part of the system—the mechanism that actually supplies the water—is located in a corner of the basement or some other out of the way place. Unless that mechanism is ***absolutely reliable***, you are bound to experience many annoyances. Avoid all troubles—by ***starting right.*** Install a MYERS Water System—the product of sixty years experience in meeting the needs of water users.

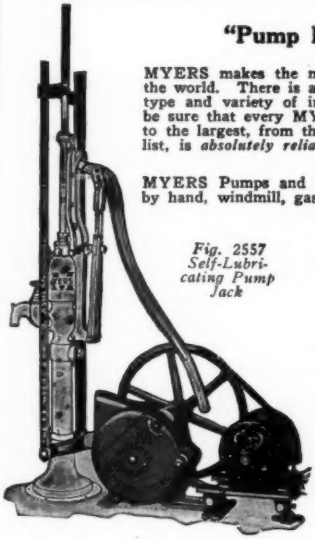


Fig. 2557
Self-Lubricating Pump Jack

"Pump Builders Since 1870"

MYERS makes the most complete line of water systems in the world. There is a MYERS system to take care of every type and variety of individual water service. And you can be sure that every MYERS Water System, from the smallest to the largest, from the least expensive to the highest on the list, is ***absolutely reliable.***

MYERS Pumps and Water Systems are built for operation by hand, windmill, gasoline engine and electricity. For deep or shallow wells. Capacities from 250 to 10,000 gallons per hour. MYERS Electric Water Systems are completely automatic—self-starting, self-stopping, self-oiling. Write today for complete information or see your MYERS dealer.

The F. E. Myers & Bro. Co.

362 Orange St., Ashland, Ohio

Pumps, Water Systems, Hay Tools, Door Hangers

Changing a Fuse

A FUSE plug always blows at the wrong time.

That is not because there is anything particularly malicious about a fuse plug; not at all. In fact the entire mission of a fuse plug is a kindly one. It cuts off the electricity for you when you might innocently overload your wiring.

Switches and meter and fuse box

The network of wires that carry electricity through the walls of your house is divided into circuits. These circuits may lead to lights alone; they may lead to both lights and convenience outlets, or they may go to convenience outlets only. They may be made of wires of different sizes; some chosen to carry heavier loads than others.

When you turn on a lamp in the living room, you ask the power company back in town to supply you with 60 watts of electricity instantly. They do. When you plug in an iron, you ask for 550 watts. They have, back there in their generators and turbines, capacity enough to make all the electricity you could possibly want. The wires of each size in your house will carry a different but definitely known load. Since the cost of wire increases with its size, most of us do not put heavy enough wiring in our houses.

To make sure that we would not ask for more electricity than those wires can carry with safety, engineers invented the fuse plug.

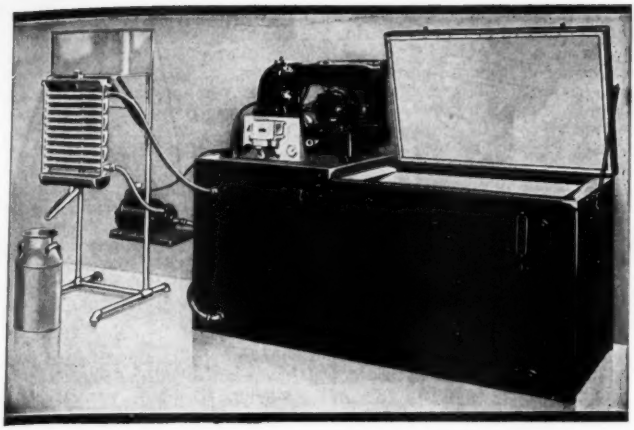
The fuse is a little strip of metal that can carry only as much electricity as the wires in its circuit should carry. That strip is fitted into a plug that screws into a receptacle like a lamp socket. When you screw it in, one end of that strip of metal connects with the wire that comes from the meter; the other with the wire that carries electricity to lamps and convenience outlets for you.

Since the wire may be of different sizes, so may the fuse plugs.

If you try to get more current over one of these circuits than it should carry, you are promptly warned of your indiscretion because that little strip of metal in the fuse plug burns up; that breaks the circuit and the lights go out.

There is no point at all in putting in a larger fuse to increase the capacity of your wires. That muzzles a watch dog because he

Standing on the wooden standard of a Christmas tree to replace a fuse



Pay For This Modern Equipment OUT OF SAVINGS!

KELVINATOR Milk Coolers *pay for themselves.* Dairy farmers in every section of the country have found this to be *a fact.*

Top prices for your milk, because of low bacteria count; the difference in cost between economical electrical refrigeration and other costlier methods; low maintenance costs and the long years of dependable service—these factors all contribute to the savings that can be made with a Kelvinator Cooler. And in addition, consider the saving in time and labor, and the freedom from worry.

It's good business to own a Kelvinator Cooler and there is no necessity to put off getting it now, because your nearest Kelvinator dealer offers you a liberal time payment plan. In many cases, the savings over former methods are large enough to take care of the small monthly installments.

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(192)

Kelvinator

might bite. With a fuse plug of proper size you cannot overload a circuit.

And when by some inadvertence you have tried it and blown the fuse, putting in a new one so electricity can flow again is as simple as changing the knives on your meat grinder.

You begin by turning off the last appliance you plugged in.

The fuses for the various circuits in your house are in a little metal fuse box. If you have built recently, they are probably out in your back hall. If they were put in a decade ago, the chances are that they are in the remotest corner of your basement. Mine are.

First you pick up a dry board or a box to stand on to insulate you from any dampness on the cellar floor. Then you pull the main switch that cuts off all the current in the house.

Your left hand holds the flash light, unless there is some one to go down with you and hold the light. If your circuits are plainly marked: *Kitchen, Living Room, East Bed rooms and Hall* you know which fuse to replace.

Unscrew it with one hand. Never use both, and never, never thrust your fingers into the socket it comes from. Screw in a new fuse.

Close the main switch.

"Is it on?" you call to the family upstairs.

If you have the right fuse, of course it is. If you haven't, you have to keep pulling the main switch to cut off the current, screwing in a fuse plug and pushing the switch up again, until the family chimes back,

"It's on."

Then you go upstairs and count the wattage of the lights and appliances that you were trying to run from one circuit, and you discover, perhaps, that you were trying to use 2,000 watts on a lighting and appliance circuit fused for 1,650, say.

And then you shift them around to divide up the load between two circuits, instead of putting it all on one.

• OUR NEIGHBORS •

Mrs. Carl Felton, Playwright

ABOUT five years ago Ralph Ammon, Farm Editor of the Wisconsin State Journal, found in his mail one morning a letter from the Springdale Community Club asking for suggestions for their next program.

"Why don't you ask the Pumpkin Hollow folks to come over and put on a play?" he wrote back.

They acted on his advice promptly, and they found the evening a huge success.

Mrs. Carl Felton

Then the Pumpkin Hollow Club asked the Springdale people to come over to their house and give them a program. That, too, was highly successful.

In fact, everybody, including Mr. Ammon himself, liked his idea so well that they wanted to extend it still further. So he persuaded his paper to sponsor a county-wide Home Talent Tournament. That very first year twelve rural clubs entered the contest.

The interest was tremendous. It overflowed the county and spread over all the state. Letters began pouring in to the University asking for a state contest so that clubs from everywhere could come down to Madison and show those Dane County players just how plays should be put on.

Workers at the University recognized the great advantage of this wide exchange of programs in the various clubs; they recognized the need of some movement to encourage the social or recreational side of

POWER *for the* FARM

This booklet, a thorough discussion of Power in Agriculture, is free upon request

AMERICAN agriculture and the electric light and power companies are engaged in a great cooperative venture—the application of electric power to farming.

The use of power—animal and mechanical—on American farms already exceeds the power capacity of all the nation's factories. But not all of this is power which can do small, scattered jobs with a minimum of human attention. Most of the power now at work on farms cannot work at a high percentage of its capacity, as an interconnected electric system can.

Electric power brings to the farm a cheap, reliable and automatic substitute for human nerves and muscular power in that vast department of agricultural effort called "chores."

Electric power is making an outstanding contribution to agriculture, while encouraging one of agriculture's most valuable characteristics—the operation of the farm by the owner and his family.

One-tenth of the farms of the United States are now receiving electric service—about six hundred thousand out of six million. The Middle West Utilities System is now serving about the same proportion of the 800,000 farms in its territory.

The possibilities of further extension of electric service in agricultural regions are fully discussed in the 112-page booklet, "Harvests and Highlines," published by the Middle West Utilities Company. The Company will be glad to send you a copy free upon request. Address Public Information Department, Middle West Utilities Company, 20 North Wacker Drive, Chicago, Illinois.

Middle West Utilities Company

COME ON—

Don't Be Bashfull

If you know of some farm woman whose story would interest the readers of Our Neighbors column, don't be bashful about writing me about her. Give us all the interesting facts you know. A picture of her or her activities if you can procure such will be much appreciated.

GAIL MEREDITH

farm life. So they promptly set to work to organize a State Home Talent Tournament and made it a part of the regular Farmers' Week Program at the College of Agriculture.

The Hillcrest Community Club won the first Dane County tournament. When they started in to work for the next year's contest, they put Mrs. Carl Felton on the committee to select a play.

That was an exceedingly happy appointment.

A Talented Leader

Mrs. Felton lives on a truck farm not far from Madison. She has her lovely home to look after; she has the telephone to mind for her husband's business; and she has two children to bring up. She is just busy enough to be the ideal committee worker. In addition to that, she comes from a line of vigorous, resourceful farm women who, if they do not find what they want at hand, promptly, make something that will do just as well.

That is how she happened to write a play.

In writing about it in her state paper, *The Wisconsin Farmer*, she says, "Being a rural community, we felt we could use a farm play to best advantage. So we set about the task of choosing one from the large list available.

"But as we read, we were impressed with the fact that the farmer was invariably overdrawn—that is, he was either burlesqued—portrayed as something to be laughed at, or he was depicted as a hard-hearted, cowhide booted, be-whiskered, old penny pincher, whose chief aim in life was to acquire more land to keep his already overburdened family busy paying off the mortgages.

Portraying the Farmer

"Neither type appealed to us as being representative of our present-day farm people. We believed the city folks would never come to know the country folks as they really are if they judged them by these exceptions.

"To our minds, farmers are just as kind to, and considerate of their families, just as anxious for their children to have a good education, and the other worth while things of life, just as willing to make sacrifices to accomplish these ends, and just as keen and alert to grasp new interests when they are fully awakened to them, as any of their city friends. Their one great point of difference is that in the past the farmer has been slower to acquire confidence in himself; he has been afraid to express his opinions on important matters and has been content to let other people do his thinking for him.

"We wanted a play that would show the farmer at his best, not at his worst; a play where the audience could laugh with, not at him. And so, with all these ideas taking form in my mind, and with no previous experience to draw upon, I began the first draft of 'Goose Money' on Thanksgiving evening, 1927. When it was finished, I took it down to the drama specialist at the University, and she criticised it for me. Then I rewrote it.

"Our club decided to try to produce it."

Then Mrs. Felton modestly

ESCO

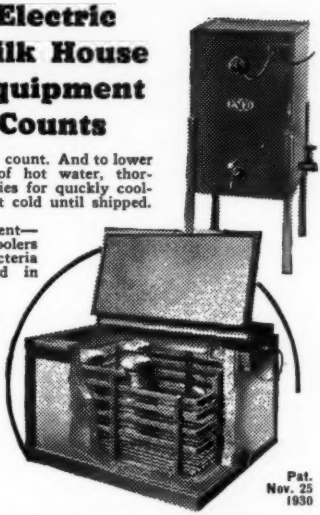
Electric Milk House Equipment for Low Bacteria Counts

To raise profits you must lower bacteria count. And to lower bacteria counts, you must have plenty of hot water, thoroughly sterilized cans and pails and facilities for quickly cooling your milk to below 50° and keeping it cold until shipped.

Esco Electric Milk House Equipment—Water Heaters, Sterilizers and Milk Coolers enable you to market milk very low in bacteria count . . . . that will be profitable and in demand.

Thoroughly engineered. Built in the very best manner and from the best materials for the purpose. Esco sets the standard of quality.

Ask your Power Company, Electric Refrigeration Dealer or write direct to us.



Pat. Nov. 25 1930

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West Chester, Pa.

The Standard of the Better Dairies

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MAKOMB DELUXE ELECTRIC BROODER

Circulates and radiates heat at a great saving in current costs. The DeLuxe Insulated Canopy with the reflecting metal interior also is a great economy feature of this perfected, guaranteed brooder. Positive make-and-break switch, guaranteed element and snap-off Automatic Temperature Control. No pitting, arcing or radio interference. The new Makomb Catalog and Poultry Equipment Guide tells all about this remarkable brooder improvement—and the complete Makomb line of equipment. Write for this big, valuable book. It's free.

MAKOMB

Poultry Raising Equipment

GLOBE AMERICAN CORPORATION, KOKOMO, INDIANA
"World's Largest Manufacturer of Brooders"

passes over the fact that the play won first place in that first statewide tournament, won it with a flair and flourish that covered both players and author with glory. I sat in the audience while it was being put on,—and remember still the thrill of pleasure I got from the vigorous simplicity, the warm human quality of the play. I laughed; I wiped away a surreptitious tear,—and I was proud, immeasurably proud of our neighbor who wrote it and played in it.

But I want to tell you about it in her own words.

Pride in Work

"Right here I want to say that immeasurable credit is due the members of the original cast for the hard work they put into perfecting the parts and making it a success. Many times were were ready to drop it and withdraw from the contest, but our pride would not let us.

" 'Goose Money' was written in the hope that it might do its bit in the great awakening process in rural communities; that it might act as a mirror in which farm families can view themselves and find an inspiration."

Then quite reasonably the executive board decided that "Goose Money" and the members of the Hillcrest Community Club that had played in it were barred from the tournament in 1929. So, Mrs. Felton went over and helped a club in Stoner's Prairie with their play that year.

Then along came 1930.

Mrs. Felton had become so much interested in the group the year before that she offered to write them a play for the 1930 contest. That led to "Seeing Things Right." She did not play in this herself, but coached it to first place in the third state tournament.

Then as though these signal successes as actress, author and director were not enough, she decided to publish this last play and market it herself.

Every day she received requests for the play as she had for "Goose Money" when it first came out. So she got herself an artist to draw a whimsical, intriguing picture of Grandpa Chester, got herself a publisher who set the play up for her on good, heavy paper with clear, clean type, and started in to marketing her own play.

The play is dedicated "to that earnest little group of farm men and women at Stoner's Prairie, Dane County, Wisconsin, who have 'the call of the soil in their hearts and like the feel of real dirt on their hands,' whose sympathetic portrayal of the characters made its initial success possible."

It sells for twenty-five cents a copy. Since the announcement of its publication was made last October at the annual meeting of the Country Life Association, Mrs. Felton has been spending hours a day in handling the orders for the play that come to her at Woodside Gardens, Madison.

I sat before her fireplace yesterday, drinking a cup of tea and talking with her of all the interesting personal contacts this direct marketing brings about.

She told me about one letter from a woman at Coalmont, Montana, asking for a copy of the play.

"I hope it hasn't an elaborate stage setting," she wrote. "We have to have plays that do not demand many stage properties. Most of us live in log houses, and we have only the necessities. If the play calls for much, we are just out of luck."

This woman lives ten miles from her nearest neighbor and seventy miles from a railroad.

All But Fathers' Club

"I have letters from people representing every organization you can think of," said Mrs. Felton. "Sunshine Clubs, Mothers' Clubs, P. T. A.—I haven't had any from a Fathers' club yet, but if they know how nice Grandpa Chester is, they'd probably be writing in too."

Mrs. Felton feels that these tournaments are distinctly worth while.

"It is amazing to see the enthusiasm a tournament arouses,"

(*Continued on page 36*)

JUST THE RIGHT CAPACITY—500 Gallons per Hour

A NEW SHALLOW WELL SYSTEM

Consider carefully the capacity you will need when selecting an electrically operated water system for your home. Make sure it amply provides running water to take care of your needs in the house, barn and other outbuildings. There are DAYTON Shallow and Deep Well Systems in every needed capacity, including the newest 500 Model, which has been especially designed to supply 500 gallons per hour. Just the right capacity for the average farm home needs. This new model comes with choice of 12 gallon, 30 gallon or larger pressure tanks and installs at a remarkably low price. Write for a full description of this and the many other DAYTON Models.

Dayton WATER Systems

The Dayton Pump & Mfg. Co.,
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Gentlemen:

Please send complete information, prices and illustrations of DAYTON Water Systems.

Name .....

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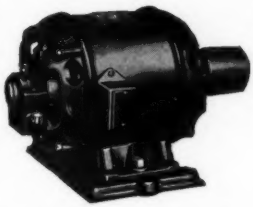
E.F. 2

MAKE THE *WATER* DO THE RUNNING



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Century Brush Lifting Single Phase Motors

Century *Brush Lifting Type* Single Phase Motors operate with complete and lasting satisfaction—hundreds of them have been operating in farm installations for more than 27 years...driving pumps, feed mills, corn-shellers, etc.

Built in all standard sizes from 1/8 to 40 horse power.

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1806 Pine St. St. Louis, Mo.

40 U. S. and Canadian stock points and more than 75 outside thereof.

Century MOTORS

Questions and Answers

Conducted by
H. J. GALLAGHER
Agricultural Engineering Dept.
Michigan State College

Note—Readers are invited to send in questions which will be answered in the order received.

Question No. 1:
Dear Sir:

I would appreciate it if you would publish or send by mail the correct pulley sizes for running a line shaft on which are belts to a grinder, grindstone, drill, saw. The motor used is ½ H.P.—1,800 r.p.m. having a two-inch pulley. I would appreciate receiving information on the speed of different sizes of saws for use with a larger motor such as 5 H.P.

Thanking you for any information, I remain

Yours truly,
R. J. ROBINSON,
PINE ISLAND, MINNESOTA.

Question No. 2:
Dear Sir:

I would like to know what size motor would be best for running a 20-inch wood saw and a small grain grinder. Also will a 5 H.P. motor run off a 110 or would it have to run on 220 to pull a saw at proper speed?

We do not know how we got along without electricity so long, —we could not farm without it now. The relief from turning the cream separator more than pays for the electricity we use.

Thanking you for the information I have requested, I am

Respectfully yours,
K. L. LOGAN,
DURANGO, COLORADO.

Answer No. 1: For general farm work the following speeds are recommended for the equipment listed:

REVOLUTIONS PER MINUTE	
Grindstone	60
Drill	500
Grinder	1,800
Saw 6"	3,000

The speed of a line shaft varies with the length of the shaft, the longer the line shaft the slower the speed it should run, 450 r.p.m. is about the correct speed of a line shaft for a farm shop.

A rule to determine either the speed or size of pulleys connected by a belt is: The speed (r.p.m.) of the motor X diameter of the pulley on the motor=speed (r.p.m.) of the driven machine X the diameter of its pulley. When three of the factors are known the fourth is easily computed.

To run a line shaft at 450 r.p.m. with your motor and two-inch pulley requires an eight-inch pulley on the line shaft determined as:

S = size pulley on shaft
1800 X 2"=450 X S
450 S = 3,600
S = 8"

The eight-inch pulley with a speed of 450 r.p.m. now becomes the factor from which the other pulley sizes are determined.

To run a grindstone slowly requires a small pulley on the shaft. Using a two-inch pulley and a line shaft speed of 450 r.p.m. the pulley on the grindstone is 450 X 2= 60 X S. 60 S=900; S=15".

The saw travelling at a high rate of speed requires a large pulley on the line shaft and a small pulley on the saw. Using a two-inch pulley on the saw, the drive pulley on the line shaft is 450 X S=2" X 3,000; 450 S=6,000; S= 13.3".

The drill and grinder are determined in like manner.

The Green Knight

PAUL WATER SYSTEM *New Low Price!*

$75

THE Paul Green Knight Water System provides the wonderful convenience of an *unfailing water supply, instantly available,* for the kitchen, laundry or bath! Mighty satisfying too—to have plentiful water, with adequate hose pressure, for sprinkling the lawn, fire fighting or washing the car.

THOUGH miles removed from city water facilities, you may, by the installation of a Paul Water Supply System, *enjoy the same modern bath, laundry and kitchen convenience as your city neighbor.* Best of all, you can enjoy this Water System while you pay for it. Only a small amount down and 12 small monthly payments buys it. *Write today for more details.*

Sold on Easy Payments

FORT WAYNE ENGINEERING & MFG. COMPANY
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Pumps and Water Systems — *Water Softener Heaters*

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Send complete information and prices on Paul Green Knight Water System . . . and Easy Payment Plan.

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( ) Please forward the Starline Bulletin on Electric Ventilation.
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Address P. O. .....
R.F.D. No. .....

SIZE PULLEYS			
On Motor	2"	On line shaft	8"
On Grindstone	15"	On line shaft	2"
On Drill	4"	On line shaft	4½"
On Grinder	2"	On line shaft	8"
On 6" Saw	2"	On line shaft	13"-14"

The speed of circular saws vary in accordance with the diameter of the saw. The cutting speeds commonly employed for circular crosscut saws are 3,000 to 6,000 feet per minute. A 5 H.P. motor is an ideal power unit for the farm buzz saw.

The speeds of different size saws are determined as: A 20" saw, 6,000' per minute; circumference of saw $= \frac{3.1416 \times 20''}{12''} = 5.23$ feet.

$\frac{6,000}{5.23} = 1,147$ r.p.m. of saw. A six-inch pulley on the motor and a nine-inch pulley on the saw.

Answer No. 2: A 5 H.P. portable motor is the best electric power unit on a farm for such jobs as grinding grain, buzzing wood and other heavy belt-driven jobs. You will find in the preceding answer the speed of a 20-inch saw.

A 5 H.P. motor will run on 110 volts provided it is properly connected for that type service, but the practice is not to be recommended. On 110-volt service the feed wires to the motor would have to be twice as large as when 220-volt service is used. In addition to this greater expense the operation is not as satisfactory. Most power companies do not permit motors larger than ¾ H.P. in size to be operated on 110-volt service as it interferes with the general service.

Our Neighbors

(*Continued from page 32*)

she says. "Old and young will travel miles in all kinds of weather to attend a contest. Exchange of plays between neighboring communities will build up friendly relations and broaden your viewpoint. There is no better way to learn self-confidence and poise than to take part in a play. The unusual exercise of brain and body will cause mental and physical fatigue, but will eventually lift you out of your rut and make you alert and independent."

From her coaching experience she gives these practical suggestions to rural clubs:

"Try to give everyone a part to play at some time. People everywhere are too prone to sit back comfortably and wait to be entertained. The greatest benefit to the individual comes through helping with entertaining. Our experience has been that we obtain best results by choosing actors suitable to the characters they represent, letting them in stage parlance, play 'straight parts.'"

We who are interested in her work are hoping that 'Seeing Things Right' is by no means the end. We need more farm plays for farmers by farm folks.

New Brooders

(*Continued from page 21*)

well-known statistics I was referrin' to show that they are the most important cash crop we have. So I move you, Mr. County Agent, that whatever else you put on that program, we get a feller down here from the Agricultural College to tell us how to tell a good electric brooder from a poor one and how hot to keep it and how to run it after we get it.

"I remember readin' in The Prairie Farmer that the whole success or failure of a year's chicken business depends on those first few weeks out there in the brooder house, so some good advice on that subject ought to be pretty dang popular."

So when brooding season comes around next spring after this winter's Farmers' Institutes, we are going to know the ins and outs of doing it electrically.

An Englishman was visiting this country for the first time, and as he was driving along the highway saw a sign, "Drive Slow. This means YOU." The Englishman stopped in surprise and exclaimed, "My word, how did they know I was here?"

A Real Flow of WATER all over the place

KEWANEE
HIGH PRESSURE
WATER SYSTEMS

High-Pressure means you get all the water you want—**not only in the house**—but in barns, at watering troughs, for sprinkling lawns and gardens. And high-pressure means a strong, steady stream capable of sending water up on the roofs of your buildings, **insuring real protection from fire.**

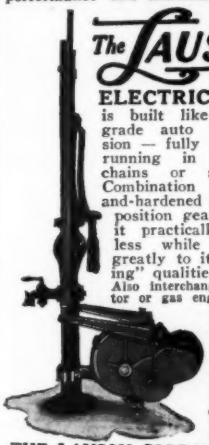
It makes no difference what the source of your water happens to be—deep or shallow well, cistern, lake, or river—there is a Kewanee System capable of providing you from 200 to 10,000 gallons of fresh, clean water per hour.

Let us help solve your water problem, just as we have helped many other owners. No obligation. Just WRITE.

KEWANEE PRIVATE UTILITIES CO.
464 Franklin St., Kewanee, Ill.

A DIRECT GEARED ELECTRIC JACK

with a reputation for durability performance and maximum safety.



The LAUSON
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is built like a high grade auto transmission — fully enclosed, running in oil. No chains or sprockets. Combination of cut-and-hardened and composition gears makes it practically noiseless while adding greatly to its "wearing" qualities. Also interchangeable motor or gas engine types.

Complete Water Systems

Write for Literature on Either or All.

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700 Michigan St., New Holstein, Wis.

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WHY not make it easy to find what you want by keeping all your issues of ELECTRICITY ON THE FARM together in a binder? You would find this a great time saver and convenience.

We have a special one for subscribers with the words ELECTRICITY ON THE FARM printed in gold ink on the cover. The cost is only $1.50 and it holds the issues for a full year. Want one? Then send us your Check or Money Order for $1.50 for one "Electricity on the Farm" issue binder.

Address: Book Dept., Electricity on the Farm
24 W. 40th St., New York, N. Y.

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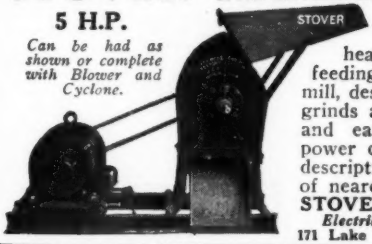
5 H.P.

Can be had as shown or complete with Blower and Cyclone.



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Ground feed makes healthier, better stock—cuts feeding costs 20%. This Stover mill, designed for high-line use, grinds all small grains, shelled and ear corn. Consult your power company. Write us for descriptive literature and name of nearest dealer.

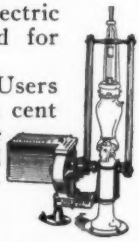
STOVER MFG. & ENG. CO.
Electric Driven Farm Machinery
171 Lake Street Freeport, Illinois

Cullman *Electric* **PUMP DRIVE**

COSTS LESS TO OPERATE

The patented Load Equalizer allows a smaller motor to be used which cuts down the cost of electric current used for pumping.

Well built. Users report not a cent of expense after several years operation.



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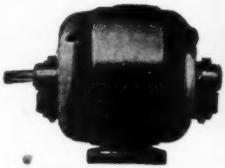

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Truly an indispensable hired man is the Fractional Horse Power Motor—Use it on the pump, fanning mill, feed grinder, tool grinder, freezer, meat chopper, washer, and many other applications.
Cost is very nominal, operate economically, give long service.
Demand Marathon "OK" Motors upon appliances that you buy. They will insure you long and satisfactory service.

MARATHON Electric Mfg. Co.
Box 440,
WAUSAU, WISCONSIN

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If they can't supply your wants
see Inside Back Cover.

BUY DURO NOW

And settle the water supply problem forever—only a few dollars down payment brings fresh running water under strong pressure, piped into your house. Makes possible water in the kitchen, bath, inside sanitary toilet, laundry, water for sprinkling, lawn and garden, live stock and chickens. Write for illustrated electric water system catalog.

THE DURO COMPANY
537 E. Monument Ave., Dayton, Ohio

DURO
Automatic Water Systems

MORE PROFITS *from Chicks*

For breeders, poultry-raisers, hatcherymen—extra quality, extra profits in Petersime Electric Hatched Chicks. Petersime Incubators give unmatched results — lowest operation costs—built in five sizes from 1,400 to 15,984 capacities.

Write for NEW FREE Catalog. No obligation.

Ira M. Petersime & Son
EF-32, Gettysburg, Ohio

Front Cover Title Contest

First Prize for December—$25.00

"A 'Train of Thoughts' not hard to see,
A 'Lectric Train it's sure to be."

Mrs. Geo. W. Jones, Jr.
R. 2, Newark, Delaware.

The following titles have been selected as winners of the $5 cash prizes:

"Now Santa Claus, just write it plain, for me, a nice electric train!" G. W. Helfman, R. 3, Ovid, N. Y.

"Santa's orders from the boys are always sure to be electric toys." Chas. Paschal, R. 3, Carrollton, Ga.

"Electricity radiates Christmas joy, both to Santa and the little boy." Mrs. T. J. Huffer, Guthrie, Okla.

"Getting around Santa with an 'lectric line. Mrs. J. Watson Vibert, South Windsor, Conn.

"Everyone will be satisfied, if Santa's gifts are electrified." Mrs. Jennings Kallay, R. 1, Painesville, Ohio.

Rules for February Contest

For the best title to this month's front cover illustration, a cash prize of $25.00 will be awarded.

In addition, we will pay $5.00 for each of five titles given honorable mention.

In case of a tie, each winning contestant will receive the full cash prize to which he or she is entitled.

The winners will be announced in the April issue.

Only the farmers or members of the farm family, to whom this magazine was sent, are eligible.

Only one title may be submitted.

Use the form below or write your answers on a plain sheet of paper in similar form.

Contestants must answer question (a).

Write plainly and send your suggestion to the Title Editor, ELECTRICITY ON THE FARM, 24 W. 40th St., New York, before March 1.

My title for February Front Cover picture is.....

.....

.....

.....

.....

(a) If you own a radio, please fill in
(1) Name of manufacturer

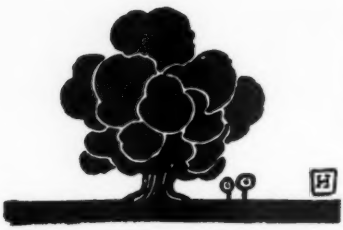
.....

(2) Check kind of power that runs it.

☐ Dry Cell Battery
☐ Storage Battery
☐ House Current (all electric)

Name..... R. F. D.....

Post Office ..... County..... State.....



Under The CHESTNUT TREE

Electrified

Judge, to prisoner: "What is your name and occupation, and what are you charged with?"

"My name is Sparks. I am an electrician, and I am charged with battery."

Judge, after recovering: "Officer, put this man in a dry cell."

—*The Pink Rag.*

"Did Mr. Edison make the first talking machine, Pa?"

"No, my son, God made the first talking machine, but Mr. Edison made the first one that could be shut off."

Juror: "I can't serve on this panel, Judge. Just one look at that man convinces me that he is guilty."

Judge: "That's not the prisoner. That's the prosecuting attorney."

"Hy, Bo, where you been? Ain't seen you for 30 days."

"Ain't nobody seen me for 30 days."

"Wha' ya been doin'?"

"Thirty days."

Isn't It the Truth?

When a bird finds a parking place, it sings. When a man finds a parking place, he keeps on swearing.

The Artist: "I hope you won't mind me coming to sketch in your field, sir?"

"Oh, no. You'll keep the birds off the peas better'n any ornery scarecrow."

An old lady visiting in a penitentiary said to a burglar: "Have you no plans for the future on the expiration of your sentence?"

"Oh, yes, ma'am. I've got the plans of two banks and a post-office."

Mixed Up

Two friends were riding home on a street car one night after attending a party where intoxicating drinks had been dispensed. One said to the other, "Wha' time is it?" The other took hold of the wrong end of his watch chain, pulling out his knife instead of his watch, and after squinting at it said, "Iah Wednesday." "Shtop the car," exclaimed the first, "'at's where I git off."

Ikey was learning subtraction.

"If you had eight pennies and lost three, how many would you have left?"

Ikey: "But for why should I lose three pennies?"

Mother: "Mary, aren't you getting too big to play with boys?"

Mary: "No, mother; the bigger I get the better I like 'em."

American (At a Scottish football game): "Why don't they start? They ought to have kicked off half an hour ago."

Scotsman: "Ay, something serious has happened."

American: "Not a player taken off ill?"

Scotsman: "No, worse than that—they canna find the penny they tossed up with."

Biggs: "Ted is very fond of his country sweetheart. He says that he loves the very ground she walks on!"

Boggs: "He means it, too! That land is worth $300 per acre!"

Laugh This Off

Grocer: "Then you don't want no cranberries?"

Customer: "No; I've changed my mind. I see your cat is asleep in those cranberries."

Grocer: "Oh, that'll be all right. I don't mind waking the cat up."

A farmer, in great need of extra hands at haying time, finally asked Si Warren, a town character, if he could help him out.

"What'll ye pay?" asked Si.

"I'll pay what you're worth," answered the farmer.

Si scratched his head a minute, then announced decisively, "I'll be darned if I'll work for that!"

Gets the Votes

The humor of English political campaign speeches, at its best, is unsurpassed. When the late John Morley had finished an oration by requesting his hearers to vote for him, one man jumped up and shouted angrily, "I'd rather vote for the devil."

"Quite so," returned the unruffled statesman, "but in case your friend declines to run, may I not then count upon your support?"

Finest, Fastest Electric Clipper Ever Invented

Universal motor for any 110 volt direct or alternating current.

STEWART Clipmaster

It's the world's fastest. Has 100% reserve power. Is very light. Has perfect balance, with easy, comfortable grip in any clipping position. Quality built throughout. 25 feet of rubber covered cord plugs in any light socket. Fully guaranteed by world's largest makers of clipping and shearing machines. At your dealer's or sent direct; $2 with order, balance on arrival. Get catalog describing this and other models of world's largest line of clipping and shearing machines.

$18.50

F.O.B. Chicago with strap handle, $19.50 with built-on aluminum handle.

Chicago Flexible Shaft Company
5524 Roosevelt Road Chicago, Illinois

Certified

SEWAGE DISPOSAL SYSTEMS

Important as Running Water for Your Farm Home!

When you install modern plumbing, remember that a safe sewage disposal system must be provided. Don't take a chance on cheaply-built equipment. Only a reliable system will furnish the health protection and trouble-free service that you will need.

Be safe! Install a complete San-Equip "Certified" Sewage Disposal System! Follows specifications of U. S. Health Service and leading authorities. Costs no more than you may pay for a cheaply built system. Easily installed. Send for information that will save you money. Write name and address on the margin and mail to San-Equip Inc., 782 East Brighton Avenue, Syracuse, New York.

San-Equip

SEWAGE DISPOSAL SYSTEMS

Valuable Information

All the manufacturers you will find represented in our advertising pages have interesting and valuable data about their equipment which is yours for the asking. When writing, be sure to mention ELECTRICITY ON THE FARM.

Andis Animal Clipper

THE NEW ELECTRIC

Fast—clips udders and flanks, 8 to 12 cows an hour. Weight only 3 lbs. No cables or stands. See dealer or write for full details.

ANDIS CLIPPER COMPANY
1642 LAYARD AVE. RACINE, WIS.

A Prized Servant

By far the most prized electrical servant to me is my automatic electric iron. Thanks to this wonderful invention, "sad-irons" no longer stand on my stove waiting for convenient time to use them. The electric iron saves steps, thousands of them in one month, it saves fuel, smoke-stained clothes from smutty irons, and burned hands. When one is ready to iron, just plug in, and presto, in five minutes you are ready to begin. Without hesitation I proclaim the electric iron the most necessary household servant of all the electrical inventions.

MRS. E. H. RICHARDSON,
Clintonville, Conn.

• • •

Health and Happiness

My refrigerator adds most to the health and happiness of the entire family.

Daddy is relieved of the five-mile ice haul. Ice cubes, melons and desserts refresh him in summer. The bill for refrigeration is cut considerably.

The children enjoy "at least three cups of milk daily" for the temperature is just right.

Mother has no more worry about food spoiled by varying temperatures. She has the satisfaction and convenience of preparing food in quantities twice a week instead of smaller amounts daily. Home butchered meat keeps without freezing—an advantage in flavor and labor.

MRS. H. L. WAHLGREN,
Valley, Neb.

• • •

Electricity vs. Inexperience

Electric appliances are a great boon, especially to the inexperienced housekeeper. We were fortunate last January, to secure the electric current. Before that, I had struggled for several months with the oven of my coal stove. I could seem never to strike the right temperature for baking.

In my electric range, however, I have no trouble whatever. The precision thermometer is wonderful—absolutely perfect results are obtained. Top cooking is a joy, also, because one can regulate volume. With the switch turned to "low," nothing ever boils over. The heat is uniform and dependable, saving countless minutes, not to mention labor.

The second invaluable helper is the refrigerator. Words cannot express my praise of this appliance. Only after using one for nearly a year, can one realize what a necessity it is! To be absolutely certain that every ounce of food is sure to "keep," produces a tremendous mental relief. This fact is especially appreciated if a person lives at a distance from stores.

The hydrator is refreshing, both to its contents and to the housewife. One almost feels cool as she handles the crisp vegetables. They will remain crisp, too, for days and days. The frozen dessert tins are a gracious luxury, although after having used them, they become a veritable necessity, never to be relinquished.

My praise of all electric appliances is unbounded, though I have mentioned but two. Those connected with "eats" appeal to me most. Use electricity; it has no peer!

MRS. WILLIARD SLADE,
Hubbardston, Mass.

CLASSIFIED ADVERTISING

The LYON ELECTRIC COMPANY manufacture electric poultry equipment exclusively. Long, practical experience in the highly developed California rural electric field enables us to furnish quality devices at reasonable prices. The LYON line includes: Brooders—Incubators — Egg Testers — Burglar, Temperature and Power-off Alarms — Heating Elements—Thermostatic Supplies—Time Switches—Wiring Supplies. Write for catalog today. LYON ELECTRIC COMPANY, 2075 Moore Street, San Diego, California.

FOR SALE—QUANTITY NUMBER 3 SHELDON MIXERS. Concrete and Feed Mixers at big reduction. Now's the time to plan CONCRETE tanks, floors and improvements. All easily done by using ½ H.P. Motor or Engine. Write: SHELDON MIXER COMPANY, NEHAWKA, NEBRASKA.

MERCHANDISING SUPPLEMENT
Electricity on the Farm

Vol. 4 FEBRUARY, 1931 No. 2

FARM EQUIPMENT WEEK

Each year the National Association of Farm Equipment Manufacturers sponsors a "Farm Equipment Week." This "week" is developed on the belief that the wide awake farmer can be made to appreciate the fact that one of the most effective methods of achieving success in farming is through the use of modern machinery.

And right now in this period of low prices for farm products it is not a difficult matter to show the average farmer that it is the man with adequate equipment who stands the best chance of making a fair operating profit.

The Association has done very constructive work in the past in cooperating with farm implement dealers, farm publishers, and other organizations, and equal cooperation may be expected this year. Those interested in the sale of farm equipment and machinery cannot afford to pass up the opportunity for developing new business. Get on the band wagon and cooperate in carrying out the Association's Farm Equipment Week program.

Aiding the Farmer to Solve His Problems by Graphic Presentation

WHEN Westinghouse introduced the Rural Electrification Album the cuts used were reproduced in a 9x12 size in order to get proper ratio. The size is comparatively easy on the eye, sufficiently large to show to a small group and of correct ratio for reproduction in most advertising material, as well as for reproduction on film slides of 35 millimeter size, on regular lecture slides, or this material can even be reproduced on 16 millimeter film; strip to strip makes an admirable material for insertion in a movie to demonstrate a particular idea.

The story carried in the original album is consecutive in order, particularly developed for the farmer who does not yet have electricity on the farm. However, when this album was received in the offices of the Northern States Power Company, their engineers in the rural department felt that there was an enormous amount of such material available which would be useful for the farmer who already has electricity and which would carry the idea continuously to a point of complete demonstration of the ultimate possibilities of electricity on the farm.

Drawings Are Prepared

The rural department set about immediately to prepare drawings to demonstrate their ideas of installations and points which the farmer should know in connection with any particular piece of equipment, especially points which would develop a sale or more satisfactory use of the equipment already on the farm.

The same size and scheme as applied to the Westinghouse Album is being used on this new material. In order to obtain absolute uniformity of lettering, regardless of who might be the draftsman, all lettering is done with the use of the mechanical guide and pens manufactured by Wrico Company. It is intended to maintain the same size as is used in the Westinghouse Album for the graphic presentation and remarks are to be used in the same manner as in the album.

It is expected that there will be sections developed as follows:

1—Wiring.
2—Feed Grinder Installations.
3—Refrigeration Installations.
4—Graphical presentation of the value of lights in egg production.
5—Brooders-showing details of good construction and installation.

To Continue Work

Numerous other subjects will follow from time to time and the material will be placed in the album in such manner as to be progressive in developing a continuous story by graphical or pictorial form.

Quite frequently it will be essential to present much reference data concerning the same subject and these will be typed on to a vellum, backed up with carbon in such manner that proper blue prints or negative Van Dykes can be made.

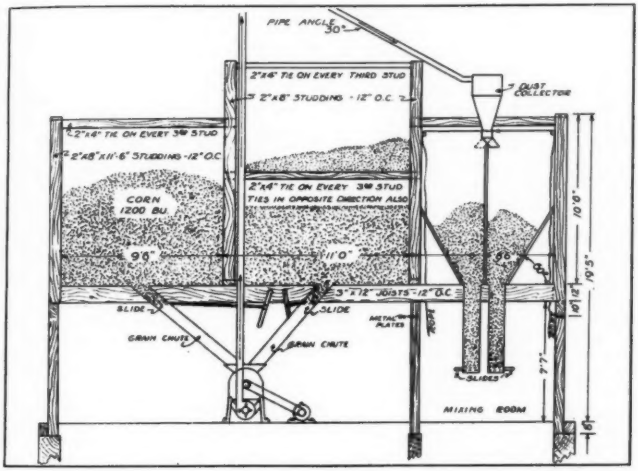
In the finished form, this material will be on blue line prints, cloth for durability, and to permit using a cleaning substance which will keep the book presentable regardless of the grimy hands of the rural service man.

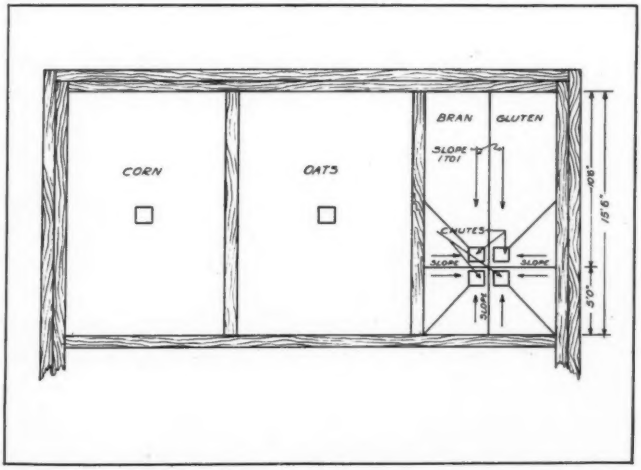
It has been thought that other companies might desire to draw on the material supplied by the Northern States Power Company. Likewise, the Northern States would appreciate ability to draw on material of similar development by other companies. For this reason, the Northern States Power Company has placed its signature on the bottom edge and in order to protect material which might be-

come obsolete by reason of time, a numbering system has been adapted which uses the month, date and year. For instance, December 1, 1930 would have 120130 as its number. Should it become necessary to number more than one production a day, then the alphabet will follow, as the second print would be 120130-A.

In order to facilitate distribution

(*Continued on page S 11*)





Upper: Chart 1, showing general arrangement of an automatic feed grinding installation. Lower, Chart 2, showing plan view of above installation.

Improving Poultry with

ELECTRIC VENTILATION

RICHARD BOONSTRA *

ONE of the most fertile fields for electric ventilating equipment at the present time should be in areas adjacent to the larger cities where poultry raising has obtained a good start because the proper amount of fresh air is very important in the production of eggs.

There are at the present time in operation many methods of ventilating poultry houses, but in spite of all of those systems, many poultry farmers will tell you that the problem is not yet solved. A system that works well in one neighborhood has often been found not to work so well in another. This, in many cases, is due to the location of the poultry house. One may be sheltered by trees and buildings, while one would be placed in such a position that all of the prevailing winds would strike it full force. It may be that if all of those conditions were taken into consideration before ventilating equipment is installed, present owners of such systems would be entirely satisfied.

I believe the time will come when proper insulation will be recognized as being the first essential toward putting in ventilating equipment.

Mr. D. G. Womeldorff engaged in rural electrification work in the territory around Joliet, Illinois, has recently succeeded in installing an up-to-date ventilation system in the chicken house of Mr. J. J. McCarthy, whose farm is located a short distance north and west of Joliet, Illinois. The chicken house has a capacity of 3,000 chickens.

How It Operates

This installation was made jointly with the ILG Fan Company. The ILG fan installed will change the air from 4 to 5 times per hour, and, as Mr. Womeldorff states, the system is on par with that of large department stores. The system is so constructed that all the foul air will be removed from the building through flues, and at the same time the fresh air will be drawn in

* Agricultural Engineer, Public Service Company of Northern Illinois, Chicago.

Proper ventilation of poultry houses has been found to be beneficial in the production of eggs. Above is shown a structure well equipped for this purpose.

through the intakes, being warmed to the proper temperature before the chickens breathe it.

The fan can be adjusted to run at high and low speed, the high speed changing the air six times, and the low speed three times per hour. The high speed is used in the mornings and evenings before the chickens go to roost, to get rid of the foul air, while the low speed is maintained during the day to obtain the proper circulation.

Cost of Operation

It is estimated that the cost of running the fan is about three-fifths of a cent per hour—approximately five cents per day. On the basis of 3,000 chicks, the cost of operation would be .0016 cents per chicken per day, based on ten hours of operation per day. It is also estimated that with this proper system of ventilation, an increase in egg production can be expected as high as 10%, although this remains to be proved.

In our territory we have an approximate market for at least 3,000 such ventilating systems, and we hope to have as many people as possible to see this modern installation in order to spread the idea over the entire territory.

Increasing Use of Current on Wisconsin Farms

By Paul Kayse

FARMERS of southeastern Wisconsin have been quick to recognize the advantages of applying electric service to agricultural chores, according to observations by The Milwaukee Electric Railway and Light Company.

This company was among the first in the country to extend electric power lines into rural districts, and reports that its farm customers have been progressively alert to the possibilities of increasing the uses for electric energy.

In general the Milwaukee company finds that the longer a farmer has been using electric service, the greater is his consumption of energy, because year by year he finds additional means of profitably employing his silent servant.

A recent survey disclosed that 100 rural customers, selected at random from those who had been on the system for five years or longer, had increased their average consumption by 33 per cent in five years.

At present the average farm consumption of electricity is 1,250 kilowatt hours per year. The farmer, it is pointed out, has opportunity to apply electric service to his business as well as to his household.

Both total and average consumption of electricity by farm customers has been increasing steadily each year including the present, the company reports. A similarly consistent increase in number of rural customers has been noted each year. An increase of 5.1 per cent in number of farm customers was noted for the first six months of 1930.

Data on Farms Only

The data quoted involves only bona fide farms, excluding country stores, summer homes and similar places that may incidentally be connected to rural power lines.

Dairying is the principal occupation in the district served, though many farmers diversify their output with produce for the Milwaukee vegetable, fruit, egg and poultry market.

Thus there is opportunity for the profitable employment of electric service for milking, milk cooling, cream separating, silo filling, brooding, barn, roost and yard lighting, water pumping, feed grinding and other typical farm chores.

In addition to exclusively agricultural applications, electricity is used liberally in the farm homes of southeastern Wisconsin. Besides lighting, electricity is employed for cooking, refrigeration, water heating and many other domestic requirements. It is a pleasant commentary on the progressiveness of Wisconsin farmers that their homes in many instances are more adequately equipped with these modern conveniences than are the homes of average city dwellers.

Rural Electrification Short Course at Urbana, Ill.

Due to the growing desire on the part of farmers to obtain special information on rural electrification, the College of Agriculture of the University of Illinois has for several years given this subject a place on the annual Farm and Home Week program.

This year's meeting was held at the Farm Mechanics Building, Urbana, Illinois, on January 13th, 14th, 15th and 16th. A very interesting program was presented. The short course differed from the usual run of courses in that a great many of the subjects discussed did not deal with rural electrification.

Papers presented on the subject of rural electrification included: "Some Results in Using Lights for Egg Production," by L. E. Card; "Some Problems in Selling Rural Electrification," by G. R. Brownback; "Some Requirements of a Farm Water Supply," by Prof. E. W. Lehmann; "Milk Cooling," by P. H. Tracy; "Requirements in Installation and Use of Milking Machines and Cream Separators," by W. L. Gaines; "Seed Testing and Germinating," by J. J. Pieper; "The Mechanics of Feed Grinding and Processing," by T. E. Hienton; "Electric Hotbeds," by R. R. Parks; "Barn Ventilation, Illinois Requirements," by H. J. Honholt.

Attractive Farm Display by Kentucky Company

This completely electrified miniature farm is a window display in the "Courtesy Station" office of the Public Utilities Development Company, Louisville, Ky., specialists in the development of rural and farm electrification in Kentucky and Indiana.

The company serves 31 communities and many farms in the bluegrass state. Service in Indiana is furnished by the Utilities Development Company of Indiana, the Louisville company's Indiana operating subsidiary.

This window display, which is situated on one of the main streets of Louisville, has attracted much attention and many inquiries, and has done much to stimulate local interest in the development of rural electrification.

Here's the window that attracted attention to Rural Electrification.

Many Exhibits at Farm Show

Bigger and better truly describes the 1931 Pennsylvania Farm Show held this year in the new building provided by the State Assembly, at Harrisburg, Pa. It is estimated that 50,000 people daily attended this show which ran from Jan. 19th to Jan. 23rd.

Among the manufacturers who exhibited electrically-operated equipment were the following:

American Incubators, Inc., Babson Mfg. Co., Boggs Mfg. Corp., Cherry-Burrell Corp., De Laval Separator Co., Delco Light Products, Eastern Sales Co., Fairbanks, Morse & Co., Frick Co., Globe American Corp., Gould Pumps, Inc., Hanover Engineering Co., Hunt, Helm, Ferris & Co., James Mfg. Co., C. A. Kaestner Co., Kerr Chickeries, Inc., Louden Machinery Co., Myers-Sherman Co., F. E. Myers & Bro. Co., Modern Equipment Co., Niagara Sprayer & Chemical Co., Philadelphia Elec. & Mfg. Co., P-T Milk Cooler Co., Papec Machine Co., Pennsylvania Joint Committee on Rural Electrification, Perfection Milker Co., Inc., Ira M. Petersime & Son, Robinson Mfg. Co., Shenandoah Mfg. Co., Skinner Irrigation Co., Stover Mfg. & Engine Co., Smith Incubator Co., Universal Milking Machine Co., Westinghouse Elec. & Mfg. Co., Wolfe Engineering & Sales Corp.

A Heater for Hot Beds

Electromaster Inc., of Detroit, Mich., have just announced a new product in the shape of a heating element for hotbeds, seed germinators and propagating benches. This element, which is in the form of a square wired grid, is made with a width and length of 33 inches, and, with the thermostat, is 2½ inches deep. The heater element is a single conductor of high resistance wire, and the heater complete has fourteen parallel runs of the wire.

Rural Service Men Meet at Pump Factory

On January 6th, a conference of instruction was held at the Plant of Goulds Pumps, Inc., Seneca Falls, N. Y., for the Rural Service men of the Empire Gas & Electric Co. Division of the Associated Gas & Electric System. Seventeen inside and outside salesmen and mechanics spent the day in discussion of pumps and pumping problems. While the construction of each type was adequately covered, the principal purpose of the meeting was to familiarize the men with the application and operation of the various types of pumps. Installations and other problems occasionally encountered in pump practice were also touched upon. Mr. H. L. Boyer, of the Commercial Sales Dept. of Goulds Pumps, Inc., was in charge of the discussion and all arrangements.

RURAL ELECTRIFICATION Salesmen's Forum

Stationary Spray Plants

THE spread of the stationary spray plant east of the Rocky Mountains is an important event to power companies located in the Middle West and Atlantic regions, which may be serving fruit growing districts in their territories. Electric motors are well suited to the operation of these stationary plants and offer the companies another possible outlet for the sale of electric current to orchard owners.

Spraying is no doubt the most important single operation in the orchard. Trees and fruit must be properly protected against inroads of fungus and insect pests or other operations would be practically useless in the orchard and ultimately necessitate the abandonment of fruit growing.

Spraying Under Difficulties

In addition to its being a very necessary part of orchard management, spraying must be done very rapidly at certain times to secure satisfactory protection and this not infrequently during rainy weather with very muddy conditions prevailing in the orchard. The evolution of what was probably the first stationary spray plant came about because of the necessity of making application of a spray to prevent scab in a California pear orchard at a time when the orchard was flooded. This is best described in the words of the orchard owner, Mr. Hayward Reed of Sacramento, in Bulletin 406 of the University of California.

"The year 1906 was a disastrous one for me," writes Mr. Reed. "The scab infection was so bad that 98 per cent of the crop were No. 2 and No. 3 pears. Improper spraying was the cause. The following year, 1907, was my most successful season. High grade pears with other favorable conditions made this possible. As the time neared for scab spraying, a great flood came. I sprayed in boats while I could, but when the water receded some, this could not be done. Wagons also were of no avail. In a quandary, I told Honda (my foreman) to couple the hose lengths together and spray as far as possible. We kept on until a thousand feet were used. At that time I conceived the idea of using pipes. Knowing how much cheaper and stronger they were, I felt they could carry the spray material long distances, and that hose attached at different intervals would operate successfully. The following year, 1908, I installed the underground pipe system at Rose Orchard, using ¾-inch pipe for main and laterals. Since then I have enlarged the system, using 1½-inch for main and ¾-inch for laterals. The year 1909 proved the value of the pipe system. Another great flood came. Our spraying was done on time by men working in gum boots. Later I installed the system in the New England, Folsom and Gridley orchards."

Mr. Reed's problem, while an unusual one and not frequently encountered, helped to find the answer to those of other orchard owners who had experienced difficulties in getting their spraying done at the proper time with portable spraying machines. Muddy ground interfered with the transportation of the machine and its accompanying load of liquid spray material, especially where the land in the orchard is slightly rolling. This difficulty is well illustrated by a case in one orchard in Southern Indiana where it was necessary to apply a spray shortly after a heavy rainfall in the spring of 1929. A tractor was ordinarily used to

pull the fully loaded machine and tank through the orchard, which was rather rolling. Following a heavy rainfall a second tractor was required to help the first one pull the machine with the tank only half full.

The solution of another problem of many orchardists in California and Washington is given as one of the important reasons for the very rapid adoption of the stationary spray plant in those states. The use of this type of spray machine eliminated the necessity for transporting the equipment across the irrigation ditches which carry water to the orchard and permitted irrigation and spraying to be done at the same time.

Stationary Plants for Terraced Grounds

Another problem of a somewhat similar nature which is overcome by the use of stationary spray equipment is that encountered by orchardists whose orchard land is so rolling that it must be terraced to prevent the soil from eroding as are many in the orchard regions of Southern Illinois and Indiana. Crossing and recrossing these terraces is often hazardous to the machine and results in cutting holes through the terraces which are particularly undesirable. In other orchards subject to erosion but unterraced, the tracks made by the wheels of the spray machine may become paths for the flow of water down the hill and result in the formation of ditches, which is another recommendation for the use of the stationary machine.

A Real Saving in Labor

Another very important item in the use of the stationary spray plant is that of the saving of labor effected by the use of the stationary machine over that required by the portable outfit. This saving in labor is no doubt due to the saving in time required for the portable machine to return to its water supply source for additional spray material. In the case of the stationary machine one man usually cares for the pump and the tanks containing the spray liquid. Two tanks are commonly employed and while the one is being emptied by the pump, the other is being filled with water and the required material added. This saving of labor over the portable sprayer is estimated at from one-third to one-half. The saving is due largely to the fact that two men are required with each portable machine while in many installations of the stationary type the man who does the spraying drags the required hose over the ground himself. In some installations, however, where a man pulls the hose and another does the spraying, this saving in man-hours over the portable machine is approximately the same as that where one man does the spraying alone. This is due to the fact that the man handling the spray gun is able to work more rapidly than where he must drag the hose and also do the spraying.

A Study of Speed

Professor C. L. Burkholder of the Horticultural Department of the Agricultural Experiment Station is making a thorough study of the time required by the portable as well as the stationary type of spray plant in the state of Indiana. At the recent conference on rural electrification held at Purdue, Professor Burkholder made a report of a time comparison between portable and stationary spraying. This comparison was made on the 250-acre orchard of Coffing Brothers, Silverwood, Indiana, where in 1929 a stationary plant had been installed on 100 acres of the older bearing area. In this report, it was brought out that in 1928 it took 6 men 6 days to cover this block in applying one spray using 3 medium sized portable rigs or 360 man hours and 360 horse hours and that in 1929 they covered the same area in 2½ days using 7 men or 175 man hours. This saving in labor of one-half is similar to that reported previously even though two men were used to each spray gun, one man doing the spraying and the other pulling the hose. The owners estimate that a comparison between the two methods of spray-

ing would follow very closely the following figures:

1928—Cost, spraying 100 acres with 3 medium sized portable machines:

6 sprays, horse and man labor only	$1,080
Interest on investment of $1,500 (including one extra team for spraying only)	90
Depreciation on $1,500 @ 16 2/3 % (6 year basis)	250
	$1,420

1929—Cost stationary outfit for same 100 acres:

6 sprays—labor only	$ 420
Depreciation @ 8 1/3% (12 year basis)	250
Interest on Investment @ 6% on $3,000	180
	$ 850
Difference in yearly cost	$ 570

The first cost of the stationary plant per acre in the Coffing orchard is $30, which is slightly below the average figure of $37.50 per acre given for California conditions (Bulletin No. 406). Costs are usually higher with smaller acreages due to the fact that the cost of a spray machine does not increase in proportion to the capacity. A plant installed near Indianapolis, Indiana, in the spring of 1930 to spray a 10-acre orchard cost $925 or an average of $92.50 per acre, which is greater than that for the Coffing orchard because of the smaller acreage involved.

The type of power unit for the stationary spray plant, which seems to be preferred alike by western orchardists and those adopting it east of the Rockies, is the electric motor. In Indiana during the past two years five stationary spray plants were installed and of this number two were equipped with electric motors at the start. Two of the remaining three will be operated during the coming season with electric motors, as electric service will be available to operate them by that time. The other does not have electric service available. The first plant of this type to be used in the state, and probably the only one besides the five mentioned, has been driven by an electric motor since its installation.

Reliability First

One of the chief sources of trouble with the portable spray machine has been the difficulty with the engine used to drive it. A balky engine on a spray machine never made any friends during the spraying season and it is easy to understand the choice of electric power for the operation of stationary machines where possible to do so. The necessity for immediate operation when ready to spray is particularly important with the stationary machine, for it usually comprises the entire spraying equipment when used. Any delay because of power trouble will stop the entire spraying crew. On orchards of any size where portable machines are used, several are required and the failure of one to be kept in operation is not as disastrous as if the entire plant were stopped through failure of the source of power to function. Reliability therefore and not necessarily cost of power is of greatest importance to the owner of the stationary spray plant.

It is entirely possible that the extension of electric lines into farm territory may play a large part in changing the type of spray plant used. No method has been found to adapt the use of electric power to the portable spray machine but since it is readily usable for the stationary type of plant where service is available, the increase in the number used is very apt to continue.

A recent estimate of Professor Harry L. Garver of the State College of Washington places the number of stationary spray pumps at between 1200 and 1500 installations in the Wenatchee district in Washington. This represents at least half of the total number of spraying installations in that section.

Through the states east of the Rocky Mountains the spread has been gradual until at the present time more than forty such installations have been made. These are scattered through many states, including Georgia, New Jersey, Maryland, Virginia, West Virginia, New York, Pennsylvania, Ohio, Michigan, Indiana, Illinois, Iowa and Missouri.

There are several disadvantages to the stationary spray system with

which the man interested in its increased use should be familiar. The chief of these already mentioned is first cost of the entire installation. A second is the loss in pressure from the pump to the spray gun. This difficulty is minimized through a central location of the plant and the use of pipes of proper size and proper installation of them. These remedies, however, do not eliminate the necessity for carrying heavier pressures by the pump on the stationary plant than those by the portable outfit, since in any stationary installation there will be a pressure drop in the pipes. Another disadvantage is that of the possible delay of the entire spray program when the stationary plant is the sole machine used for spraying because of mechanical trouble with the power unit or pumping system.

Summary of Advantages

A brief summary of the advantages of the stationary spray plant will serve to indicate the reasons for the adoption of these plants regardless of the disadvantages mentioned. The chief advantages are that spraying can be done when needed, a very important factor at certain times in the control of disease and insects. Secondly, spraying is done more easily, particularly in rolling country, since it eliminates the difficulty of crossing terraces or irrigation ditches, and is independent of soil conditions as they affect transportation. Thirdly, the saving of labor is considerable and may be sufficient to more than counterbalance the difference in first cost. Fourthly, the use of electric power is made possible and this to a considerable degree offsets the possibility of a shutdown of the plant due to trouble with source of power where electric power is available.

Two publications have been issued which contain considerable information on stationary spray plants and their installation and operation. One previously mentioned is Bulletin 406 of the Agricultural Experiment Station of the University of California, Berkeley, California, and the other is General Bulletin No. 212 of the Agricultural Experiment Station of the State College of Washington, Pullman, Washington.

Manufacturers of stationary spray plants are:

Bean Spray Pump Co., Lansing, Michigan, and San Jose, California; Friend Manufacturing Co., Gasport, New York; Hardie Manufacturing Co., Hudson, Michigan; F. E. Myers & Bro. Co., Ashland, Ohio.

Graphic Presentation

(Continued from page S 3)

of this material, those who might desire more than one copy or a number of copies would be supplied with negative Van Dykes and could in turn make as many prints from that Van Dyke as they might desire.

If a number of company rural departments, the universities and manufacturers each develop only a few of these presentation plates, there will be available an enormous quantity of material which each individual rural man can arrange in his own album in such manner as to present his own story in a most acceptable form.

F. Warriner with Master

F. Warriner, formerly general works manager of the Fairbanks Morse Company (Indianapolis, Beloit and Three Rivers plants) was, on January 2nd, elected vice-president in charge of production of the Master Electric Company of Dayton, Ohio.

Farm Light Plants

A line of alternating current plants have just been announced by D. W. Onan & Sons, 65 Royalston Avenue, Minneapolis, Minnesota.

This is a gasoline electric plant generating 110-volt, 60 cycle, alternating current, made in three sizes, 500, 1,000, and 2,000-watts and in six models, manual and self-starting.

There are many original features in these plants. A four-cycle, single-cylinder engine is connected through a special flexible coupling to an alternating current generator of compound, separate excited type, which is so wound and balanced as to produce even voltage and accurate cycle.

BOB'S PAGE

Devoted to Merchandising of Electrical Equipment in Rural Communities

Conducted by Robt. J. Fulton

Competition

COMPETITION implies a contest between two or more concerns or persons for the same object. It may be classified as follows:

1. Service
2. Quality
3. Terms
4. Prices

Competition has been the means of raising merchandising to its present high plane by allowing those who conduct their business in a manner which renders a valuable service to the buying public to survive.

Service is the most vital factor in accomplishing this purpose. The electrical, implement or hardware dealer can make it wiser for purchasers to trade at his place of business for their needs; go elsewhere, or send away to distant cities for their requirements. But, he cannot hope to accomplish this end or be at the top in his particular line by remaining in a state which is half or all dead insofar as merchandising methods are concerned.

A clean and orderly store, bearing his name in a prominent place where "everything" carried "in stock" or sold "on order" is attractively displayed, is the only method that will enable him to reach present day standards.

Keeping Stocked Up

The implement, hardware or electrical contractor dealers who are going to make a real job of getting the electrical appliance and motor driven equipment business in their communities during 1931, must ask themselves these questions: Do I keep in "stock" or sell "on order" all of the appliances of equal quality to those sold by competing concerns? If not, why shouldn't I broaden my stock in order to have a representation as good as my competitors? Am I selling at the same prices as other concerns, or am I trying to undersell by cutting the profit? Are my competitors substituting merchandise of a higher or lower quality than I carry? If so, what is the difference in quality? Do I carry in stock all the electrical appliances and motor driven equipment that will meet the needs of my community?

Most people consider "competition" as price cutting. The cutting of prices is only legitimate as a means of stabilizing a badly disturbed market or in order to quickly sell merchandise which is hard to sell or which is laying dead in stock. When price-cutting is employed merely to make sales, it presupposes the lack of sales ability or mental laziness on the part of the seller.

Remember this—the unsupported statement by a price-cutting competitor to the effect that he is giving better values for less money usually falls flat before the persuasive appeal of appliances and motor driven equipment which are well exhibited in the manner as applied in actual use.

* * *

Sales are not made by the bald statement that certain dealers' goods are not equal to the lines you carry. "Knocking" a competitor or his merchandise invariably does more harm than good. Sales demonstrations must be used. Have your store so arranged that your electrical appliances and motor driven equipment are displayed in such a way that it is easy for those interested to examine and get the "feel" of them. By handling

"UTILITY"

Meter and Switch Boxes

Metering Transformer Housings

Transformer Cabinets

Sub Station Tool Boxes

Place the Meter Where It Belongs

"Utility" Meter Boxes are made to help your farmer customers get more service from the use of electricity. Mounted on a centrally located pole, they permit a more economical distribution layout for the customer and make it convenient to operate the largest possible number of machines by electricity.

We manufacture a complete line of boxes for all types of meter installations used by central station companies and municipal electric light departments in all parts of the country.

Write for Complete Illustrated Catalog and Price List

F. D. KEES MANUFACTURING CO.

BEATRICE, NEBRASKA

Blue Ribbon Electric Milker

A Portable Milker Requiring No Installation

The "Blue Ribbon" is a self-contained milker, requiring no pipe lines or extra equipment of any kind. It operates direct from the light socket of either high line or farm light plant. A beautiful catalog and complete information will be sent on request. Write us today.

Electric Products Corporation

7 Bluff Ave., La Grange, Ill.

BRILLION-BEVAN

Line of Electric Farm Equipment

Electric Pumpers

Pump Jacks

Water Systems

Electric Farm Grinders

BRILLION IRON WORKS

Brillion, Wis.

merchandise prospects ask questions. The asking of questions means that half of the sales resistance is broken down as the prospect wants to know about what you want to sell him.

Study your community and carry and display the appliances and equipment that will fit their needs. Then go after this business with all your might. Keep constantly in your mind the a-b-c of success, which is:

Ambition
Backbone
Concentration

This, coupled with Edison's definition of a genius—"2% inspiration and 98% perspiration," will make 1931 a better year for you and also make you a better merchant.

G. E. Establishes Model Store

The General Electric Supply Corporation has established a sales room and exhibit in the Merchandise Mart, Chicago, the increasingly important merchandise show place of the middle west.

The display, arranged as a modern electrical store, combines an atmosphere of comfort with business efficiency and has been installed not only as a convenience to electrical dealers in selecting material for their own stock, but also to suggest attractive set-ups which might be adopted in any modern electrical store.

Included in the display are G. E. radios, clocks, cleaners, sun lamps, washing machines, ironers, lamps, Hotpoint appliances, ranges and water heaters, and Walker dishwashers. Special fixtures, designed to give each item its proper prominence, are in harmony with the modernistic scheme of interior decoration featured in the sales room.

COMING MEETINGS

RURAL ELECTRIC SALES SCHOOL. First Rural Electric Sales School to be held under direction of the Middlewest Division, N.E.L.A., February 26-27, 1931 at Kansas City, Mo. Program prepared especially for rural salesmen. Those interested in rural electric expansion urged to attend.

MISSOURI ASSN. OF PUBLIC UTILITIES. Annual state convention April 16, 17, 18, 1931 at Excelsior Springs, Mo. Jesse Blythe, Assistant Secretary, Merchants Bank Bldg. 108 West High St., Jefferson City, Mo.

The Model Electric Store in the Merchandise Mart, Chicago.

Collection Letters That Got Results

By Fred E. Kunkel

"WE use only Triple-X Diplomacy in collecting our accounts," says an electrical jobber, contractor, dealer whose collection system works automatically. "We send out weekly follow-up letters on all overdue accounts until payment is received.

"And we keep close tab on the rising temperature of all sick accounts, but when we talk to them we do it in a friendly vein. We don't get hard-boiled about it. And we use tact in wording our collection letters.

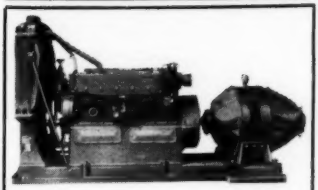
"Our letters go out weekly, one—two—three fashion, until results flow in, and this steady stream of shrapnel brings home the bacon, first, because these letters act as weekly reminders, instead of being once-in-a-whilers, and secondly, because they are diplomatic messengers and so worded as to give no offense. Coming regularly every week they keep the debtor from cooling off at the heels and they also wear down his crown of psychological paying resistance.

"These letters are, of course, typewritten and go out as an individual appeal for money rather than as a form letter, which may account for their effectiveness in bagging results. They are just like a personal request for money and the debtor recognizes them as something out of the ordinary from the accustomed collection form letter method. Consequently, he pays more attention to them. Here is the string of letters as ground out by the diplomacy mill, which rakes in the coin from week to week.

1st Week's Letter

"I wish to apologize for bothering you, Mr. ————, but we have no record of having received a remittance from you in payment of the enclosed account.

"No doubt you overlooked this



Electric Power Plant

HEADQUARTERS

1½ to 35 Kw. — A.C. and D.C.

When you are wondering how to make some real money from electric plants — turn to UNIVERSAL. Here is a line of complete self-contained units to service anything from a farm to a small town. Stock plants are made in 1½ to 35 Kw. sizes, A.C. or D.C.—in portable, stationary or marine types. Special installations for similar requirements made to order. Direct-connected, easy-starting, 4, 6 and 8 cylinder gasoline engines are built into the complete units and entire installation designed for correct operating characteristics and unfailing service.

UNIVERSAL IS ELECTRIC POWER PLANT HEADQUARTERS. Thousands of units in use all over the world. Write us at 58 Universal Drive for attractive dealer proposition.

Universal MOTOR CO.

OSHKOSH, WIS., U.S.A.

bill, or you have simply mislaid it. So here is another. How about a check today?"

2d Week's Letter

"It may be that you are displeased with some dealings you have had with us lately, which may account for the delay in paying your account with your accustomed promptness. If so, kindly tell us at once, and don't keep us in the dark any longer. We are anxious to know and to make it right.

"If everything is O.K. between us, don't bother explaining why you have not sent us a check, Mr. ————, but just pin your check, payable, in whole or in part, to this letter and return it to us right away.

"Yes, do it today!"

3d Week's Letter

"We are sorry to bother you again, Mr. ————, but no doubt you prefer us to remind you that you have overlooked sending your remittance for the enclosed statement of account.

"Won't you please send us a check or money-order by return mail, or enclose a crisp five or ten dollar bill on account? Then it won't slip your mind again, and we won't have to write you any more letters."

4th Week's Letter

"We are in the dark, Mr. —— as to whether you have run into a streak of hard-luck lately, or are weathering financial storms. At any rate, if you will let us in on the secret, we'll make all due allowances.

"But if you continue to simply ignore our earnest letters, we will soon gather the dark suspicion that you don't intend to pay us. So just make a clean breast of the whole matter and we'll guard your secret.

"A check in whole or in part of your account, $————, or an explanation scribbled below, will satisfy us. By return mail, please!"

5th Week's Letter

"We hope that your continued silence, Mr. ..... is not due to any dissatisfaction with your dealings here.

"We hope you intend to pay us sooner or later, but the sooner the better. Why not now? Why not pay $5 or $10 today, if you cannot pay all, and let us carry the balance for 30 days more without bothering you again?"

6th Week's Letter

"It must be annoying to you, Mr. ———— to receive so many letters from us about your bill, and we hate to write them as much as you do to receive them, but we have asked you five times to send us a payment on your account, and five times have you failed to do so.

"Won't you please take care of this matter by return mail? Why not make it a point to let us hear from you right away, so we won't have to send you any more letters? We're counting on you this time sure! May we?"

7th Week's Letter

"We are naturally sorry to bother you again, but no doubt you prefer us to remind you that you have overlooked sending your remittance on the enclosed account. The amount is not so large, so you just naturally pay no attention to it, Mr. ————, but won't you look at it from our standpoint for a moment?

"These few dollars mean practically nothing to you, but multiply them with several hundred similar accounts on our books, and you can see how these small matters cripple us financially.

"A word to the wise is sufficient. Help us out with a remittance in tomorrow's mail. We're counting on you! Don't fail us this time!"

8th Week's Letter

"I am making this last and final appeal to your sense of honor to pay something on your account, if not all of it right away. I am writing you personally about this, Mr. ———— because I don't want to sue you, for I think you want to pay us eventually.

"So just write me why you cannot pay, but do it today, or send me a check as an evidence of your good intentions. I've written you seven letters so far, without result. I'm not going to write you any more letters about this account. I've got to have something definite now, by next Tuesday, at the latest."

Any one of the string may bring home results, but should the last personal appeal fail to bag any response, a telegram is now sent out in the form of a typewritten message on yellow paper and with similar captions to a telegram blank. This telegram is the final warning before action.